anufacturers Record



While Taxes Mount

All the fancy laws, all the pump priming, all the efforts to make over life in America which are largely nonsense. and already have proved unworkable, won't do the trick of promoting prosperity. The only way and the sure way is to so conduct government as to have enterprise and capital feel safe to go ahead.

The debt load is becoming unbearable and more spending is not only proposed, but is being urged. Where has it gotten us so far? There are still ten million and more unemployed and more people than ever are trawing doles in one form or another from government, while the lact stares the country in the face that taxes must mount and mount if the enormous debt is to be paid. The way to pay it is being thrust aside. That is what worries investors and business men.

It is time for employers to tell what industry means to America. It is time for employees, who after all are bearing most of the burden through taxes seen and unseen, to know that their jobs are not secure, with no outlook for the future, if industry is paralyzed. That is what industry will be if the present course is kept up.

The whole scheme, first and last, has been political and scandalous.

PEFERENCE

NOT LOAA



CONTINUOUS STEEL GIRDERS Provide

386'-8" Continuous Plate Girder (4 lines), Hill Street Bridge over Buffalo River which we built for the city of Houston, Texas.

Russ Mitchell, Inc., Houston, General Contractor.

Virginia Bridge

the dependable and lasting strength needed for street and highway crossings of today. Likewise they adapt themselves readily and economically to the symmetry and grace of the arch.

We have built many such bridges throughout the South and Southwest as well as those of the older and more conventional types.

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DEPARTMENTS

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly by the
MANUFACTURERS RECORD PUBLISHING CO.
FRANK GOULD, President

Main Office: Manufacturers Record Building, Commerce and Water Streets,
Baltimore, Md. Phone: Plaza 7080-1.
Branch Offices: New York—11 W. 42nd St. Phone: Longacre 5-7180.
Chicago—28 East Jackson Blvd., Room 1510. Phone: Harrison 5867.
Cleveland, O.—850 Euclid Ave., Room 310. Phone: Cherry 4050.

Subscription Rates: One Year \$2.00, Two Years \$3.00. Single Copies 25c, back numbers over 3 months old 50c. Other Publications of the Manufacturers Record Publishing Co. Construction (daily and monthly issues) \$10.00 a year. Construction (monthly issues only) \$2.00 a year. Blue Book of Southern Progress (annual) \$1.00 per copy.

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WOMEN KNOW HOW TO TREAT A B.T.U.

When a woman wants to get a quantum of heat into a mess of victuals, she doesn't fool.

She reaches for an Aluminum Cooking Utensil. At least that is what seven out of eight house-

wives do, which counts up to about 26 million ruleof-thumb heat engineers who endorse Aluminum.

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A sauce pan is a simple heat exchanger; its big brothers, resplendent with tubes and baffles, and what-not, are saving money in many applications in the process industries.

Diesel engines are designed around the superior heat conductivity of Aluminum. It has made possible higher compression ratios in automobile engines. It is put to work by alert engineers in autoclaves, waffle grids and air conditioning units, and in both heaters and refrigerators.

Aluminum conducts heat rapidly. Can we help you use that property? Aluminum Company of America, 2109 Gulf Building, Pittsburgh, Pa.



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WHY CAPITAL HESITATES

In a recent letter to Senator O'Mahoney, Chairman of the Senate Monopoly Investigating Committee, President Roosevelt said it was up to the Committee to find out why investment capital is not going into private enterprise.

Volumes have been written about the course which has scared capital, and it may be put down as certain that the fear engendered by the attempts to change economic laws and handicap private initiative, which has made this country's progress the greatest in world history, will not be dissipated until there is abandonment of profligate spending and an earnest attempt to balance the budget.

In spite of the reams of copy put out by government writers concerning the deplorable state of the so-called "submerged third", the "underprivileged" and the need to succor them by the hand of a beneficent government; in spite of the anathemas hurled against "princes of privilege" and "economic royalists", the fact remains that private business is the sole hope of the country for employment, for progress, for permanent welfare, and for the payment of taxes.

If the number of unemployed had been materially reduced, if the detrimental effects of the Wagner law, the Wage and Hour law, the hampering effects of the Social Security law and other measures that have misfired and remain threats—if these menaces were removed, or if practical results had been accomplished by the spending that has gone on, business might have some assurance that still it could go forward by adjusting itself to circumstances, but investors see too much confusion of plan and purpose except in one direction and that is the persistence of the fever for spending without limit.

Private enterprise has been so handicapped by mischievous laws and is being taxed to such a degree to pay the enormous cost of unworkable social reforms, it is hardly to be wondered at that investment money should be held back.

While the President's letter to the Senator was being read, press dispatches carried the report that administration officials were studying plans for further spending that might involve three billion dollars more.

If anybody can find encouragement in that, in view of the failure of results from previous spending, they must be optimistic to a degree that exceeds the bounds of reason.

Congress at the moment is holding out an olive branch by promising tax adjustments in sections of the law which the administration at last seems to recognize have failed of the purpose for which they were intended as punitive measures when they were enacted, business being the scapegoat.

Encouragement is found in the attitude of certain leaders in Congress and Treasury officials recognizing some outlook is essential if private enterprise is to survive. Most results from Washington in recent years have been to cripple business.

As we see it-

 $T_{\rm HE}$ abatement of war fever in Europe is encouraging to those who have hoped the world might be spared another horror so vast as to imperil the civilization built up over hundreds of years.

The security market and general business consequently have felt better during the past few weeks.

Other indications point to more activity in our own affairs at the moment despite major discouragements which continue to hold back expansion plans and capital investments.

THE money situation continues easy with rates at abnormally low figures. Credit is abundant and plans are being discussed at Washington to make it more so. How far this will compete with commercial banks which have had a hard row to hoe remains to be seen. Despite talk to the contrary, they are hungry for loans to take up surplus funds.

The Comptroller of the Currency announced that on March 29 deposits in national banks were larger than on any former call date in the history of the National Banking System.

Carloadings, always a barometer, have been rising. In the third week of May three major railroads of the East and Central sections showed sizeable increases over the same period of a year ago. The Pennsylvania Railroad gained 17.8 per cent, the Baltimore & Ohio Railroad 31.5 per cent, and increases were reported by the New York Central and other roads. Part of the gain must be credited to increased movement of traffic following settlement of the coal controversy.

ELECTRIC power production, as the records for May were being written, was 10.3 per cent above May 1938 figures. As civilization and better living increase in direct ratio with improvement of transport facilities, so too the facilities distributed broadcast over the land by private utilities must be accorded their due credit.

W hat do the bright minds which would place special taxes upon new machines say about the dynamo and motor that have brought light and power to far away places and lessened the burden of the housewife and mechanic? If they stop long enough to think the thing through, how can they take the position that any labor saving device is inimical to progress, or can do otherwise than add to employment.

As Dr. Millikan of the California Institute of

Technology, who knows whereof he speaks beyond most men, has stated an unvarying rule has accompanied the machine over the years—employment of more wage earners per thousand of population, with better hours and more pay.

The Iron Age calls attention to the misguided opinions of a number of men. Some in prominent places in public life have picked out as objects of special punitive taxation those who install new machinery which may temporarily reduce employment. Some legislatures have fallen into similar mistakes by putting such nonsense into law.

Men who view the progress of America and sense the throb of life here, and contrast the way our people live with people anywhere else on earth, view with amazement, if not alarm, the ideas of those who would set back the clock's hands and, believing in laissez faire, have the tens of thousands of young men who have graduated in recent years from our institutions of learning hide their talents, go back home, and call it a day.

AGRICULTURAL research by workers in the farmchemurgic field is opening a new era of development in the South. Attention is being centered upon beef and dairy cattle and diversified crops.

The Blue Book of Southern Progress has shown the value of the South's manufactured products is now two and one half times the value of its agricultural products. Through research the farmer is enabled to supply the rapidly developing Southern chemical industry with raw materials, thereby adding to his income. The effect is likewise seen in increased employment and general wealth.

\$200,000,000 in pulp and paper mills, with more in prospect, is practical evidence of what is being accomplished along one line.

An article in this issue tells of the success attending the raising of Hereford cattle in the South Carolina "low country," the rice lands of earlier days. The editor of the Greenville, Mississippi, *Delta-Democrat Times* calls attention to Montgomery County, Alabama, which six years ago produced 61,000 bales of cotton and no beef cattle to speak of. Last year in this county there were 60,000 head of cattle and but 16,000 bales of cotton were raised.

The Wage and **Hour Law**

CONTROVERSIAL argument surrounding the Wage and Hour law continues unabated both in and out of

Congress. During the past month the Southern Governors' Conference issued a statement and resolution, among other things urging a Congressional investigation of the personnel and policies of those administering the Wage and Hour law. Justification for this is found elsewhere in the statement where it says:

An analysis of the background of training, experience, viewpoint, and present conduct and attitude of the personnel charged with the administration of this Act brings the Southern Governors' Conference to the inescapable conclusion that it is the purpose of the present personnel to pervert the purposes of this Act from the accomplishment of social justice to the nullification of gains recently made in efforts to modify discriminatory freight differentials."

Just what the analysis disclosed, the Southern Governors do not enumerate. Consequently it is impossible at this time to pass judgment on their conclusions.

The point, however, made by the Governors in their resolution as to the adverse effect of the Wage and Hour law upon industry as a whole, and small industries in particular, is indisputable. With this claim, two Southern Senators—George of Georgia, and Smith of South Carolina—are apparently in complete agreement, but it would seem a matter of necessity to determine at once whether the industrial tribulations referred to are results of the maladministration of the law or due to the law itself.

The position of the MANUFACTURERS RECORD has been clear in its opposition to the Act and the desirability of its repeal.

Admitting the reasons for control of wages and hours in sweat-shop industries, and laying aside the fact which is clear to us, this is a matter wholly up to the States and not the national government, yet it is an Act which in its wide implications seeks to control a phase of economic existence by legislative fiat and this cannot be done without disastrous consequences and the eventual annihilation of certain classes of industry in regions which, even now, are struggling against other differentials.

Any act of this type which fails to take cognizance of regional differences is doomed to fail of its purpose, and will inevitably lead to unemployment and greater distress.

Those of us who are familiar with the evolution of industry and the progress of its conduct are convinced that the result which the Wage and Hour law attempts to legislate would have been accomplished by industry in a satisfactory, orderly manner without injury and within a relatively short time, if only it had been given the opportunity. Business leaders realize better than those in politics the economic desirability of paying employees as high a wage rate as possible accompanied by satisfactory working conditions.

Spencer Said

"AS IT IS, however, they seem to In 1853 Herbert have read backwards the parable of the talents. Not to the agent of proved efficiency do they consign further duties, but to the

negligent and blundering agent. Private enterprise has done much, and done it well. Private enterprise has cleared, drained, and fertilized the country, and built the towns-has excavated mines, laid out roads, dug canals, and embanked railways - has invented, and brought to perfection, ploughs, looms, steam-engines, printing presses, and machines innumerable—has built our ships, our vast manufactories, our docks-has established banks, insurance societies, and the newspaper press—has covered the sea with lines of steam-vessels, and the land with electric telegraphs. Private enterprise has brought agriculture, manufactures, and commerce to their present height, and is now developing them with increasing rapidity. Therefore, do not trust private enterprise. On the other hand, the State so fulfills its judicial function as to ruin many, delude others, and frighten away those who most need succour; its national defenses are so extravagantly and yet so inefficiently administered, as to call forth almost daily complaint, expostulation, or ridicule; and as the nation's steward, it obtains from some of our vast public estates a minus revenue. Therefore, trust the State. Slight the good and faithful servant, and promote the unprofitable one from one talent to ten."

UNDER THE Chairmanship Industry's Need of Ernest T. Weir, the Na-And Opportunity tional Industrial Information Committee, sponsored by the

National Association of Manufacturers, has taken up an important work to inform the general public of the indispensable part industry has in our economy.

In the foreword of an announcement the Committee makes, this appears:

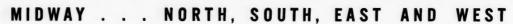
Six years ago, in the midst of wide-spread distress and unemployment, indutry's voice was lost in a welter of economic fantasies and seductive theories. Industry's message was 'suspect.' Industry's spokesmen were 'special pleaders.' Industry was the scapegoat upon which demagogues heaped all the ills and evils of the day.

'Industry's No. 1 problem was then and is now—to regain full public regard for industry."

Putting the matter in practical form, the Committee is prepared to provide employers with a comprehensive program of educational publicity through booklets and advertisements, motion pictures and radio talks for use in their plants and for wider consumption in public halls.

Low Cost Distribution Makes T.F.N.N.F.S.S.F.F.

MINOIS CENTRAL an Ideal Industrial Location





Consider these facts:

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It is the midway point on the direct Illinois Central route between Chicagoand New Orleans

as well as between the industrial East and the agricultural West.

Great oil and natural gas fields lie at its western and southern doorways.

Coal is abundant and cheap . . . power is as low as three mills per KWH.

Water flows from shallow depths in large volume. It is soft, pure and inexpensive.

Labor costs are low . . . home rule prevails in industry . . . government is economical and cooperative.

Tennessee is a rich, fertile land . . . raises commercially nearly every product grown in the United States outside the citrus fruit zones.

It has more than 30,000 square miles of standing forests—oak, yellow pine, gum, yellow poplar, hemlock and chestnut.

Along a stretch of Illinois Central right-of-way are 16 deposits of pottery clay, 9 deposits of structural and refractory clays, also large deposits of gravel and other building materials.

TENNESSEE IS A STATE WORTH INVESTIGATING FOR THE UNUSUAL INDUSTRIAL POSSIBILITIES IT OFFERS — THE OPPORTUNITY FOR PROFIT IT PRESENTS. A FACTORY HERE COMMANDS ONE OF THE RICHEST MARKETS IN THE WORLD

For industrial locations and additional information, address—

ANDERSON PACE — WALTER W. PACE Genera l Industrial Agents, Illinois Central System One North La Salle Street, Telephone Central 6441, Chicago, Ill.

ILLINOIS CENTRAL

Industrial Opportunities in Tennessee

TENNESSEE, admitted to the Union in 1796 as the 16th state, was first permanently settled in 1756 near the present site of Knoxville on the Tennessee river. In 1776, when the settlers placed themselves under the protection of North Carolina, their territory became known as Washington county but though this arrangement was temporarily satisfactory, dissension ripened when North Carolina ceded to the United States in 1786 all the territory which now comprises Tennessee. Everything might have gone well were it not for the fact that cession was not accepted by Congress within the two year period allowed. This left the territory virtually without government and consequently the people met in convention and elected a president, the outgrowth of which was the State of Franklin with John Sevier as Governor. Finally, in 1789 the territory was officially ceded to the United States continuing under territorial government till its entry into the Union in 1796.

With an area of 42,022 square miles, of which only 335 square miles are water, Tennessee ranks 34th in size while the estimated population of 2,880,000 places the state as 16th. The negro population consists of approximately 18.3 per cent of the total.

Climate

THE climate of Tennessee combines to a limited extent the rigors of the North with the tranquility of the South so that, while not equable it is nevertheless pleasing. Changes are frequent, but except in the mountainous east, extreme variations are not prevalent. The average annual temperature for the state is 58° F. and the average annual precipitation is 50 inches with the heaviest rainfall in winter and spring and the driest period in the fall. Snowfall in the western half of the state averages 9 inches, and 12 inches in the east. The first killing frost usually occurs about October 22 and the last is seldom later than April 15.

Transportation

THE total road and highway mileage within the state on July 1, 1938 was approximately 85,000 miles. Of this, the state highway system was responsible for some 7,335 miles including over 2,365 miles of gravel, chert or macadam, 1,754 miles of cement concrete, and 1,300 miles of variously treated hard surface roads; 1,872 miles have been surface treated and less than 50 miles have only been graded and drained. The remaining mileage of almost 78,000 miles comprise county roads and nearly 33 per cent of these are provided with an all-weather surface.

Bus and motor freight routes serve all the principal communities within the state and connect them with points ourside. During the fiscal year ending June 30, 1938, 57 passenger carriers operated 421 busses over 6,175 route miles in the state and carried 4,113,685 passengers. During the same period, 168 regular freight carriers operated 1,655 units over 21,365 route miles in Tenessee.

route miles in Tennessee.

Railroad mileage in Tennessee aggregates almost 4,000 miles and 90 per cent of it is operated by eight major companies through all but about eight of the state's 95 counties.

Tennessee's waterway transportation consists of portions of

Tennessee's waterway transportation consists of portions of the Tennessee, Cumberland and Mississippi rivers. At present only certain sections of the Tennessee river, not continuous, aggregating some 335 miles have a nine-foot channel, but with completion of Gilbertsville and Chickamauga dams, together with some supplementary work, a total distance of 530 miles will thus provide a continuous nine-foot navigable channel. In the meantime, the importance of the Tennessee river as a medium of freight transportation may be gauged from the fact that in 1937 over 1,610,000 tons valued at more than \$12,755,000 were carried.

The Cumberland river is navigable at varying depths for certain sections of the 516 miles from the mouth to Burnside, Ky. Freight traffic over this river in 1937 totaled 468,881 tons,

valued at \$6,883,494.

The Missispipi river is navigable throughout its length of Tennessee's western boundary with Memphis as the principal port. In 1937 freight traffic through this port aggregated 1,875,177 tons valued at \$122,414,421. At Memphis and countless other towns and cities located throughout the length of these navigable waterways, ample warehouse and similar

facilities are available.

Airlines operating five different routes over Tennessee provide a rapid means of passenger and express transportation from east to west as well as from north to south.

Within approximately 750 miles of the four corners of the state is more than 47 per cent of this country's total area, over 78 per cent of the total population, nearly 74 per cent of the wholesale and almost 73 per cent of the total retail trade.

Manufactures and Finance

THE total value of Tennessee's manufactured products in 1937 was \$707,986,784, an increase of \$187,017,799 or approximately 38 per cent over the 1935 figure of \$520,968,985. The 1937 census report lists 86 industries represented by three establishments or more and of these 70 have products annually valued in excess of one million dollars. Among the latter rayon and allied products far exceed all other industries with products valued at \$59,132,660. Other important manufactures with their respective values are: chemicals, \$38,048,636; shortenings (other than lard), vegetable, cooking and salad oils, \$36,457,022; meat packing, \$29,491,149; hosiery, \$29,219,241; clothing, \$24,014,045; flour and other grain mill products, \$22,673,578; printing and publishing, \$21,122,548; cotton yarn, thread and woven goods, \$21,016,738; boots and shoes, \$20,897,976; cottonseed oil, cake and meal, \$20,150,709; lumber and timber products, \$16,102,513; bread and bakery products, \$15,866,429; heating and cooking apparatus (except electric), \$15,265,402; tobacco, \$14,492,782; and knitted wear, \$14,358,311.

The payroll of the 135,073 employees in the state's 2,083 manufacturing establishments was \$109,247,514 while the cost

The payroll of the 135,073 employees in the state's 2,083 manufacturing establishments was \$109,247,514 while the cost of materials, fuel, electric energy and contract work amounted to \$412,360,076 and \$295,626,708 was the value added by manufacturing processes. Whereas in 1935 there were nine of the state's counties with no manufactures, this number was reduced to only four in 1937.

Individual deposits in the 303 Tennessee banks which reported to the Comptroller of the Currency, June 30, 1938, totaled \$478,606,000. Capital stock, including capital notes and debentures, amounted to \$37,504,000, and aggregate resources were \$547,249,000. Bank clearings of exchanges reporting in 1937 were \$2,241,485,000. The internal revenue collections for the calendar year 1938 were \$31,443,092.

Agriculture

ALTHOUGH the cash farm income of \$144,865,000 in 1937 was only about 30 per cent greater than the payroll of Tennessee's various industrial activities, nevertheless nearly 50 per cent of the entire population is dependent upon agriculture for its livelihood. This 1937 income was almost \$23,000,000 greater than the \$121,802,000 for 1936. Of the 1937 amount \$58,865,000 was derived from livestock and livestock products, and \$77,608,000 came from crops grown on the state's 6,482,500 farm crop acres. The principal crop was cotton and the 661,000 bales from 989,000 acres yielded a cash income of \$22,500,000 in addition to \$4,100,000 received from 294,000 tons of cottonseed. The production of 111,280,000 pounds of tobacco from 131,500 acres yielded \$15,950,000. Other important crops included 6,075,000 pounds of peanuts, 66,528,000 bushels of corn, 6,750,000 bushels of wheat, and 5,610,000 bushels of sweet potatoes.

bushels of sweet potatoes.

The number of livestock in Tennessee in 1937 was 2,964,000 valued at \$94,839,000, with cattle forming the largest group of 1,125,000 valued at \$31,389,000. Cows and heifers kept for milk number 553,000 valued at \$19,908,000. Dairy produce yielded a cash income of \$27,528,000 with milk contributing \$17,075,000. Factory production of dairy products included 15,555,000 pounds of butter, 8,682,000 pounds of cheese, and 42,341,000 pounds of evaporated milk.

Timber

NEARLY 50 per cent of Tennessee's total land area of 26, 679,000 acres is classified as forest land. This area comprising 12,820,000 acres supports a commercial forest area of 12,555,000 acres including 470,000 acres old growth and 2, 670,000 acres second growth saw timber, or a total of 3,140,000 acres, and 6,275,000 acres of cordwood.

MANUFACTURERS RECORD, BALTIMORE

The saw timber area bearing 16,950,000,000 board feet is made up of 3,400,000,000 board feet of softwoods (750,000,000 board feet old growth and 2,650,000,000 board feet second growth) and 13,550,000,000 board feet of hardwoods (4,030,000,000 board feet old growth and 9,520,000,000 board feet second growth). Southern yellow pine accounts for 1,980,000,000 board feet of softwoods which gother important software for the software for t feet second growth). Southern yellow pine accounts for 1,980,000,000 board feet of softwoods while other important softwoods include cypress (330,000,000 board feet), hemlock (320,000,000 board feet), white pine (220,000,000 board feet), and miscellaneous softwoods (550,000,000 board feet). Most outstanding among the hardwoods are oaks with 7,900,000,000 board feet, followed by yellow poplar having 1,350,000,000 board feet, The remaining hardwoods are: tupelo and black gum, 740,000,000 board feet; red gum, 650,000,000 board feet; beech, birch and maple, 210,000,000 board feet; and miscellaneous, 2,700,000,000 board feet.

The cordwood area comprises 4,337,000 cords of softwood and 17,250,000 cords of hardwood or a total 21,587,000 cords. In addition, on the saw timber area there are 6,600,000 cords

In addition, on the saw timber area there are 6,600,000 cords of softwood and 26,400,000 cords of hardwood or a total 33,-000,000 cords making a grand total of 54,587,000 cords on all commercial forest land except a few thousand on restocking

areas.

Mining and Minerals

BECAUSE of its extreme elongated east-west extension, Tennessee, crossing three major physiographic provinces, presents a variety of land forms probably unique among all the states and results in the existence of a large number of minerals. On the reverse side is indicated those counties in which present minerals are now produced. In addition, there are many deposits of these same minerals as well as of others which have been worked in the past and probably will be again, for in many instances the deposits contain extensive reserves. Too, there are many deposits of minerals known or believed to be of

commercial value which have not hitherto been approached.

Barite is at present produced in several counties and is available in many other places. It is suitable for use as a paint pig-

ment, in chemical compounds, etc.

Bauxite has been mined in the past, and known deposits of commercial value occur in shales sometimes as thick as 100 feet.

Clay resources are many, varied and widely distributed throughout the state. In western Tennessee ball, wad, sagger, and other high grade clays are available while in the eastern part shales are the basis of heavy clay products. In middle Tennessee residual and alluvial clays are abundant.

The coal area of the state is largely confined to the north cen-

tral counties and comprises bituminous and cannel coals with underclays of as much as 4,000 feet.

Copper in commercial quantity is confined to Polk county and is the largest producer of copper and sulphuric acid east of the Mississippi. Both gold and silver are by-products of the smalling. smelting.

Dolomites and dolomitic limestones exist in unlimited quantities in eastern Tennessee, much of it being nearly pure and suitable for the chemical industry.

Flourspar occurs in considerable quantity with barite in middle Tennessee and the flotation process of separation holds much

encouragement.

Granite, which is one of the most important undeveloped resources of the eastern part of the state, is most attractive in ap-pearance and exists in beds large enough to yield block building stone. From the magnetic iron ores of the same region are obtainable limonite and rutile containing as high as 20 per cent titanium dioxide.

Hematite, limonite, and magnetite—the three principal iron ores, all occur in commercial quantities in four distinct belts between the state's eastern boundary and the west-middle part

of the state. In Carter county spathic ore also occurs.

Galena, widely distributed through the limestone of east and middle Tennessee, occurs in varied abundance and offers possi-

bility of renewed lead production.

Limestone is the state's most extensively distributed rock and is widely used for a variety of purposes from lime for soil, building cement and chemicals to flux for blast furnaces. From the same source is derived a good supply of marl for liming the

Manganese deposits are found in many counties but production has been retarded by the difficulty of treating ores. With the exception of a carbonate ore in Sevier county all Tennessee

deposits are of the oxide variety.

Marbles of a variety of colors and shades occur extensively in the east and some have been found among the middle Tennessee limestones. Both have been commercially produced and much of it is coarse, even grained and resists the action of weather to a marked degree.

Oil and natural gas have been widely sought throughout the

state and though some has been found in outlying sections the principal source to date is in the Mississippian limestones of north central Tennessee.

Tennessee phosphates of brown, blue or black, and white are among the state's most valuable minerals, having ranked second in production for the country over a period of years. Deposits are extensive and almost entirely confined to central Tennessee

Among the remaining important minerals are molding and glass sand; resources of the latter it is believed are sufficient tor a well founded industry. Many deposits of sandstone are known in addition to those now worked. Tennessee sandstones are of unique coloring and design and highly resistant to wear and weather.

Although slate has been developed to little or no extent, the known deposits are large and believed to constitute a large re-

serve of commercial character

Zinc ores have been mined or prospected for many years in several eastern counties and though sphalerite is the chief ore produced in two districts to the northeast of Knoxville, oxidized ores also occur while some sphalerite ore occurs in middle Ten-

Electric Power

PRODUCTION of electricity in Tennessee during 1938 totaled 1,746,197,000 kilowatt hours, an increase of 341,826,000 kilowatt hours over the 1937 figure. Of the 1938 amount, 1,191,336,000 kilowatt hours were the product of hydroelectric plants and 554,861,000 kilowatt hours were produced by fuel operated plants.

The total generating capacity of power plants in Tennessee

The total generating capacity of power plants in Tennessee at the end of 1937 was 530,356 kilowatts. Of the 64 plants operated by 27 companies, 19 were hydroelectric with an installed capacity of 318,850 kilowatts and 30 were steam power capable of developing 207,633 kilowatts. The remaining 15 included 13 internal combustion engine plants and two combination plants capable of 3,383 and 490 kilowatts respectively.

Taxation

LL corporations doing business in Tennessee are required All corporations doing pusiness in remissee are required to pay a franchise tax at the rate of 15 cents on each \$100 of issued and outstanding capital stock, surplus, and undividend or issued and outstanding capital stock, surplus, and undivided profits at the close of the corporation's calendar or fiscal year. The minimum tax is \$10. Another tax all corporations are obliged to pay is the excise tax of 3.75 per cent of net earnings from business done within the state. Income tax, which is at the rate of six per cent, is levied upon income derived from dividends on stocks and interest on bonds.

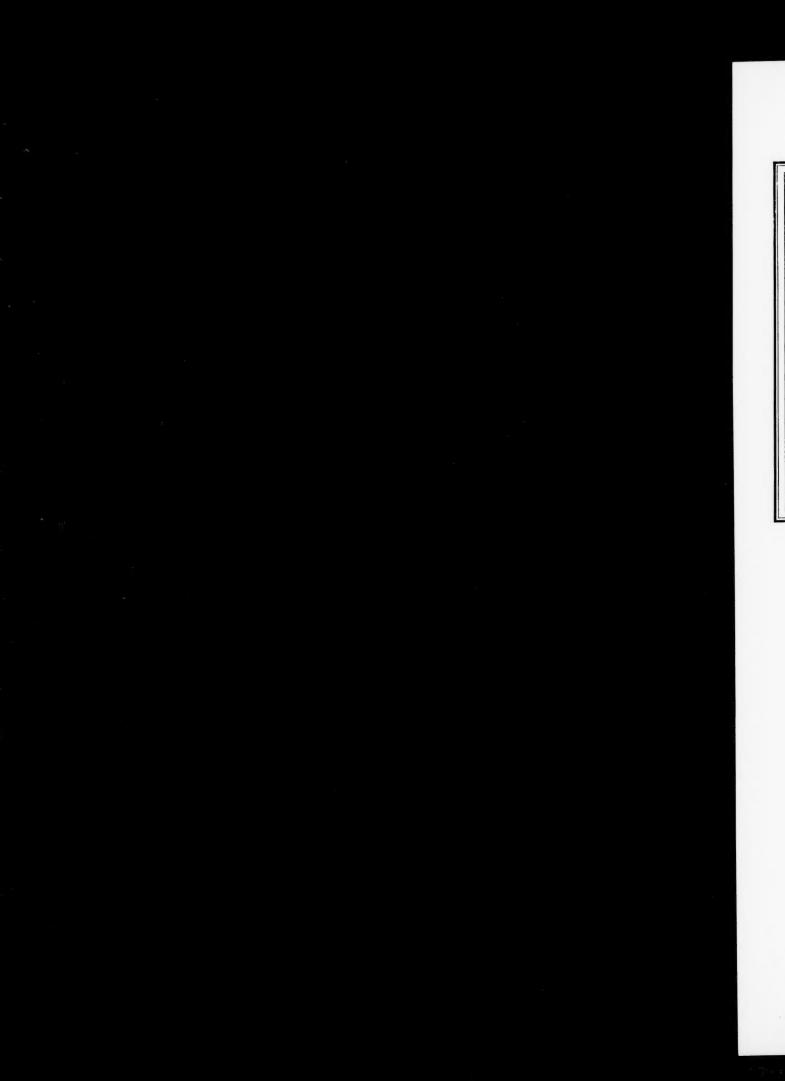
The principal county and municipal taxes are the general property tax and the privilege tax. The county property general tax rates in 1937 ranged from 88 cents to \$4.08 per \$100 of assessed valuation with an average for all counties of \$2.22. In the same year municipal general property tax rates varied from 50 cents to \$4.00 per \$100 of assessed value. The law provides that counties and incorporated cities may levy a privilege tax in the same manner as, and not in excess of the amount similarly levied by the state.

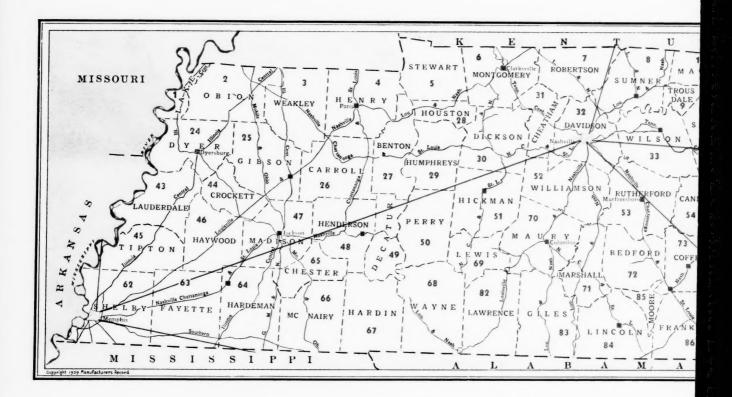
The assessed value of taxable property in Tennessee for 1937 was \$1,473,174,477.

Labor and Wages

WITH a density of 62.8, nearly 66 per cent of Tennessee's W population is classed as rural and more than 60 per cent reside outside incorporated cities or towns. Of the urban population over 71 per cent are concentrated in the cities of Nashville, Memphis, Chattanooga and Knoxville. Native whites comprise 81.23 per cent of the total population and foreign born whites only 0.50 per cent.

Due to changing conditions and the variation of rates in different localities it is difficult to approximate wage rates. However, the range existing in the districts of Nashville, Memphis, Chattanooga, Knoxville, and Johnson City may possibly be accepted as above the state average and consequently a dependable guide. Agricultural workers from \$1 a day to \$50 per pendable guide. Agricultural workers from \$1 a day to \$50 per month. Building and construction workers from 30 cents per hour for unskilled help to \$1.62\(\frac{1}{2}\) for the highest paid skilled labor. Clay products vary from 25 to 60 cents per hour. Dairy products range from \$2 per day to 60 cents per hour. Mining varies from 25 cents to \$1 per hour. Forestry averages 30 cents an hour. Foundries range from 27\(\frac{1}{2}\) cents per hour to \$7.50 per day. Lumber products from 25 cents to \$1.25 per hour. Machine shops from 40 cents to \$1.10 per hour. Meat packing averages 45 cents per hour and textiles \$15 per week. And averages 45 cents per hour and textiles \$15 per week. And miscellaneous industries range from a minimum average of 30 cents per hour for unskilled labor to a high average of 90 cents for skilled help.





TENNESSEE

Its principal raw materials and transportation facilities, with facts on the reverse side pertaining to its industrial growth and opportunities for industry.

MINERAL

COUNTIES IN WHICH MINERAL IS

Barite-15, 78, 90, 91

Cement-22, 32, 59, 86, 92, 93

Chemicals (sulphuric acid) -32, 95

Clay-3, 4, 26, 27, 35, 47, 77

Coal—13, 15, 16, 17, 19, 35, 36, 37, 56, 57,

58, 76, 77, 87, 88, 92, 93

Copper-95

Feldspar grinding—61

Glass sand—22, 35, 86, 88

*Gold-95

Iron ore, brown (limonite)-30, 51, 95

Iron ore, red (hematite) -58, 93

Kaolin-26

Lead-95

Lime-28, 30, 57, 59, 73, 86

Limestone & dolomite—22, 28, 32, 51, 52, 53, 56, 57, 58, 59, 60, 71, 72, 73, 86, 92

Manganese—23, 42, 59, 69

Marble-57, 59

Molding sand—26, 27, 64

Natural gas-16, 35, 36, 56, 74, 84

Oil-8, 11, 12, 13, 14, 15, 16, 36

Paint pigment—52, 93

Phosphate rock—32, 35, 49, 50, 51, 52, 69, 70, 33

Sand and gravel—2, 4, 6, 17, 22, 24, 27, 29, 32, 42, 58, 59, 62, 86, 88, 93

Sandstone & silica—35, 57, 77, 86

Shales and other miscellaneous clays—2, 4, 16, 21, 22, 26, 32, 35, 36, 41, 42, 47,

59, 61, 62, 64, 78, 79, 80, 82, 93

*Silver— 95

Slate-79

Tripoli and rottenstone- 19, 68

Zinc-59, 60, 95

*By-product of copper smelting.

TIMBER

Oak—2 to 8, 10 to 23, 25 to 32, 35 to 70, 72 to 95

Beech and maple—12, 15, 43, 45, 48, 53, 62, 66, 67, 83, 84

Red gum—2, 24, 27, 43, 45, 46, 62, 63, 66 Chestnut—11, 20 to 23, 27, 38, 40, 42, 59, 61, 79, 80, 81, 90, 91, 93

Hickory—5, 8, 13, 15, 17, 27, 32, 33, 34, 36, 45, 52, 53, 54, 56, 57, 62, 70, 71, 72, 74, 75, 87

Yellow poplar—13, 15, 16, 35, 36, 37, 53, 71, 75, 95

Hemlock-40, 90, 91, 95

Cypress-1, 43, 45, 62, 66

There is also a small quantity of tupelo gum, cottonwood and aspen, ash, cedar, and red and white pine.

AGRICULTURAL PRODUCTS

Corn- All counties

Cotton—1 to 4, 24 to 27, 33, 43 to 50, 53, 62 to 74, 82 to 84, 86, 89 to 95

Peanuts—2 to 5, 24 to 30, 32, 43 to 53, 56, 59, 62 to 74, 77, 79, 82 to 84, 86, 88 to 94

Soybeans—1 to 6, 8, 10 to 13, 16 to 13, 20 to 22, 24 to 35, 37, 38, 40 to 63, 65 to 68, 70 to 74, 77 to 80, 82 to 86, 88 to 95

Sweetpotatoes—All counties

Tobacco—2 to 24, 26 to 43, 46 to 48, 50 to 62, 65 to 86, 88 to 94

Natural gas is available for consumption in the following counties: 24, 47, 62, 74, 84, 93

----Railroads

Navigable rivers

-----Airlines

Airports—also at principal cities printed in red



Tennessee Central Railway Company





INDUSTRIES SEEKING LOCATIONS

The Tennessee Central Railway, through the center of the State, reaches all the wealth of natural resources found in Tennessee, as accurately described on the adjoining pages.

No State in the Union can surpass our facilities for successful manufacturing. Minerals, timber, agriculture, climate, electric power, native labor, rail, highway, river and air transportation assure successful operation.

Industry is not an experiment on the Tennessee Central.

On its rails are located numerous large and small prosperous factories.

TENNESSEE A GREAT INDUSTRIAL AREA

Come to Tennessee, enjoy and prosper with her opportunities. Our people will greet you with open arms and protect you after you are located.

Trained industrialists will supply specific information relating to your business upon request.

TENNESSEE CENTRAL RAILWAY CO.

1407 AMERICAN TRUST BUILDING NASHVILLE, TENNESSEE

TO AID AND PROTECT THE ECONOMIC DEVELOPMENT OF THE SOUTH



ash R. Hoey











Burnet & Maybank









WE, THE GOVERNORS

INVITE INDUSTRY

TO THE SOUTH

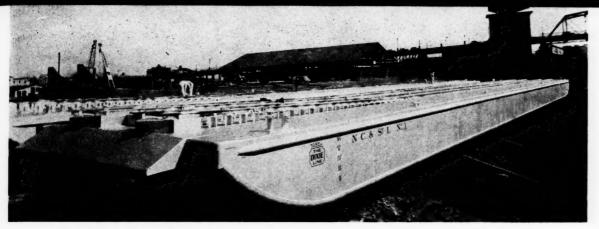
WHERE EQUAL OR BETTER STANDARDS OF LIVING COST LESS

Tr's not cheap labor, it's cheaper living which enables the native-born Southern worker to help you L cut production costs. Food, clothing, fuel and shelter cost less in the South because of our year round moderate climate. These savings, plus ideal working conditions, plus lower capital investment, plus lower construction costs, plus an unlimited supply of raw materials, are reflected in production costs. Add to this a rich and growing market and you will begin to understand the tremendous industrial expansion now under way in the South.

Southern Governors Conference

LAWRENCE WOOD ROBERT, JR., Executive Director

CARROLL DOWNES, Industrial Consultant



Railroad freight ferries built at Nashville, Tennessee for the Nashville, Chattanooga and St. Louis Railroad

Railroads Spend \$52,000,000 A Year In Tennessee

and taxes exceed one million dollars a week, according to a nation-wide survey of railway disbursements recently completed by the Association of American Railroads.

The survey, the first ever made on a national scale, shows that no fewer than seventy-nine important railway companies in the United States are buyers of Tennessee products. Thirteen of Tennessee's seventy-nine railway customers operate mileage in the state; sixty-six are non-resident roads.

An impressive array of items make up the railway shopping list in Tennessee. Hardwood lumber, cross-ties and wood products from Tennessee are purchased by railroads in many parts of the country. A glance through the reports of the

RAILWAY expenditures in Tennessee purchasing agents shows the railroads supplies, ice, and other materials and to be heavy buyers of hickory tool supplies necessary to keep their plants in handles. Railroads from coast to coast are using Tennessee handles for shovels. picks, hammers and other hand tools. Many orders for handles are placed direct with Tennessee firms; many others are placed with manufacturers and dealers in other parts of the country, who draw their supply from Tennessee, Millions of hardwood tie plugs are produced annually in Tennessee for widespread use on the American railroads.

> In addition to forest products, the survev shows the railroads to be spending large sums in Tennessee each year for coal, petroleum products, structural iron and steel, iron and steel castings, cast iron pipe, brake shoes for railway cars, paint, sand, gravel and limestone ballast, bagging, electrical supplies, commissary

operation.

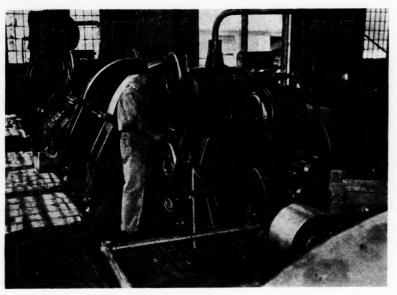
While railway purchases in Knoxville. Chattanooga, Nashville and Memphis are extensive, the survey shows that these are by no means the only centers from which the railroads draw their supplies. No fewer than 296 other cities and towns in Tennessee share in railway expenditures for materials, supplies and fuel. while an even larger number share in the railway payroll and in railway tax payments.

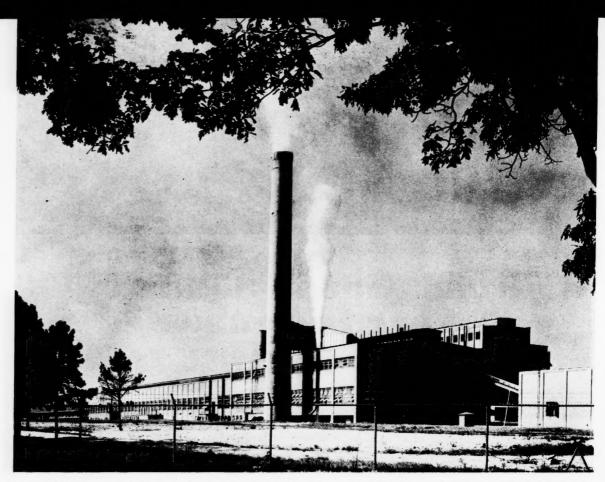
Tennessee's railroad plant is made up of fifteen Class I railroads, with approximately 3,850 miles of road in the state; and twelve smaller railroads and terminal companies with about 325 miles of railroad in the state. In 1937, the latest year for which complete statistics are available, the fifteen Class I railroads operating in Tennessee reported expenditures of more than \$8,000,000 in the state for materials, supplies and fuel. while purchases of the smaller railroads in the state and non-resident railroads brought the figure up to around \$10,000,-000 for the year. Even this large sum does not take into account numerous services and purposes for which the railroads spend money, such as telephone and telegraph service, electric light and power, water, payments to contractors. attorney's fees, rentals, insurance, medical services and supplies, real estate purchases, traveling expenses of railway officers and employes on company business, laundry service, advertising, and so on, roughly estimated at \$3,000,000 a year in Tennesse.

Railroads are property-owners and taxpayers in eighty-three Tennessee counties, and in many of these counties they are the largest contributors to the support of local government and public schools. In 1937 railway tax payments in Tennessee totaled \$3,183,233, of which

(Continued on page 52)

A wheel press in the Coster Machine Shop of the Southern Railway at Knoxville, Tenn.





The \$12,000,000 Southern Kraft Corporation mill at Springhill, La., is but one of the many recently built in the South bringing the total investment of this industry in the region to over \$200,000,000.

Chemurgy Comes South

Some of the earliest chemical industries in America were established in the South. As early as 1608 attempts were made to manufacture tar, potash and glass in Virginia; and in 1620 iron. salt and leather were actually made in that region. Legislative steps were taken in 1707 to encourage the production of saltpeter and potash in South Carolina; and the culture of indigo in that area in 1741 was the beginning of the natural dyestuffs industry in this country.

Through the intervening years the chemical industry has made further strides in the South. In 1914, 22 per cent of the entire industry was located there and by 1933 it had been increased to about 30 per cent. Since that time several things have happened to bring about an even greater expansion of the process industries in the states south of the Potomac and Ohio Rivers.

The South holds many attractions for industrial development. The area contains approximately one-third the acreage and one-third the population of the United States; but as it is primarily agricultural, it is largely dependent on the East and Middlewest for manufactured products. Considering the vast market, the tremendously valuable natural re-

BY

Dr. Harry E. Barnard

Director of Research National Farm Chemurgic Council

sources that cannot be duplicated in any other section of the country, the enormous deposits of salt, sulphur, coal, natural gas, lime, clays, glass sand, petroleum and other materials, the adequate supply of labor, power, water, excellent transportation facilities, and a mild climate, it is undeniable that no area offers greater opportunities to industry than does the South.

The South is one of the great agricultural regions of the world. It has long produced most of the world's cotton, and supplied the textile mills of every country. In recent years its agriculture has become more diversified. Outside the corn belt, it still, under favorable conditions, produces the largest yields of corn per acre. The South was the home of the soybean. It leads in the production of sweet potatoes and peanuts. Besides these annual crops, it produces cellulose in the form of wood more rapidly than any other section of the country. All of these crops: oils, proteins, carbohydrates, and

cellulose and chemical raw materials. The Chemurgic movement, organized four years ago to find industrial uses for farm crops, is cooperating with southern industries and farmers and research workers to find new uses for these raw materials, and having found them, to develop close to the production areas, industrial plants which will use them, bringing greater income to the farmer, new employment to labor, and profit to invested capital.

Already definite progress can be reported in the Chemurgic program. Faster than any other science, chemistry is extending its boundaries and diversifying the products, increasing the yearly output and constantly bringing to consumers new and better goods made from the starch and cellulose and other raw materials formed each year by the magic of the sunshine, air and the rain on millions of fertile acres.

Dr. Friedrich Bergius, the Nobel prize winner who visited us in 1936, told us that when the next war comes, and when their ports are blocked and food supplies are curtailed, the Germans are going to eat their trees. That is carrying Chemurgy to its ultimate end, so far perhaps that the farmer whom Chemurgy is try-

ing to help will be almost eliminated from the picture. For when the Germans convert saw mill and forest waste into sugar and sugar derivatives, and then, by feeding the sugar to hogs, obtain their fats, and by combining it with yeast and synthetic ammonia to manufacture their proteins, the farmer's occupation would seem to be limited to the biological process of supplying hogs.

At Laurel, Mississippi, new types of board of great importance to many industries have been developed by the Masonite Corporation, which began only twelve years ago as the result of the research program carried out almost single-handed by William H. Mason, Today, hundreds of thousands of square feet of materials made from wood, but in appearance utterly different from the logs out of which they are manufactured. go out of its shipping rooms into every corner of the world. Recent improvements have resulted in the making of plastic materials which can be used for mold-

Recent developments in the paper industry in the South so far have materialized in investments in paper and pulp mills of over \$200,000,000.

It may be important to give attention to the new materials which are competing with southern products. Rayon is listed as such a material. Twenty years ago it was of little importance. Even in 1930 rayon production in the United States was only 127,000,000 pounds. Last year 343,600,000 pounds of rayon were made in our chemical plants, the largest of which are operating in the southern states. While rayon was first used as a substitute for, or an imitator of, natural fibres, during the last few years it has gained popularity because of its own merits. Rayon today has no quarrel with natural fibres. It is a distinct textile varn, with qualities and uses of its own. There are several types of rayon, made by processes known as vicose, as acetate, and as cuprammonium. Vicose rayon is made from purified cellulose, from cot-



A transparent rubber-like substance from lactic acid (a milk product) is the result of a new process by L. T. Lee and H. V. Claborn, two scientists of the U. S. Bureau of Dairy Industry. Its unique properties make it valuable in the preparation of lacquers, varnishes, inks, cements, impregnating compounds, and as a means of making paper and textiles resistant to water.

ton linters, or wood. Acetate rayon is also made from cotton linters. To the chemist all cellulosic products are raw materials from which rayon and similar products can be made. There is of course a difference in the quality of these raw materials. Cotton linters, which are almost pure cellulose, are of course the best material, but in use they have to compete with the purified cellulose made from wood. The possibilities therefore of diverting a considerable part of the cotton crop from the textile factory to the chemical plant are purely economic.

From the cotton plant come most of our vegetable oils. Last year nearly two billion pounds of cotton seed oil were consumed as food and as industrial raw material. The huge shortage of domestic fats and oils in this country, amounting to nearly 3,000,000,000 pounds a year, is seldom if ever mentioned. It has come to be regarded as a matter of course and of no particular concern. In other words, it is not news. There is also a shortage in most of the northern European countries. There was a greater shortage there during the World War than at present. And

(Continued on page 50)



Above-The Solvay Process Company plant at Baton Rouge, La., is but one of the South's newer chemical establishments. Below-The sweet lelow—The sweet potato starch plant at Laurel, Miss., with sweet potato hotbeds in the foreground.

ing a wide variety of useful products. This plastic product has great strength. It absorbs almost no moisture, it has excellent die electric strength, it is practically incompressible, it is well adapted for making decorative panels. By the use of pigments beautiful colors are obtained.

The raw material now used is woodany kind of wood which can be delivered at the plant. Other southern crops, such as cotton stalks, okra stalks, hemp and flax stalks can all be utilized in the production of Masonite products. It is only necessary to harvest these waste crops and convey the baled material to the factory at a cost comparable with wood to develop new markets for farm wastes.





Cattle Replace Cotton In South Carolina

E. T. H. Shaffer

N his recent book, "Seed from Mada-of South Carolina tells the long and glowing story of his ancestral rice plantations on the Colleton side of the historic Combahee River. Here rice was profitably cultivated by slave labor from early colonial days down to the Civil War, and thereafter by the same family, finally by the author himself until the beginning of the present century. Then through a long combination of causes, the results of emancipation, the opening of new rice lands in the Gulf states, and a series of great hurricanes, rice culture in South Carolina was abandoned and the Heyward plantations passed to the ownership of Mr. A. Felix DuPont of Wilmington. Delaware. Truck growing was then deemed the agricultural promise in coastal South Carolina, early vegetables being grown extensively in the Charleston area for spring shipment to Northern markets. So for some years Mr. DuPont planted truck in the former rice fields, installing an elaborate drainage and irrigation system operated by steam pumps. The low rich lands failing to come up to the expectations of experts who had advised and directed the enterprise, the old rice fields, after a few years, were again abandoned. Thus these Combahee plantations for two hundred years reflected the changing agricultural fortunes of coastal South Carolina.

Mr. DuPont, from the beginning of his ownership, had raised a few cattle since the woods and higher open lands offered long winter grazing. When in 1928 Mr. Charles G. Turner came from Virginia to manage the Combahee properties, he entered at once upon more modern and scientific methods of stock raising. While he had been a successful stock man in Virginia he realized at once that here he must do pioneer work for while the cattle

tick had recently been eradicated, as yet no successful or large scale cattle raising had been attempted under the local conditions that confronted him. The story of his success with cattle on the Combahee has been one of trial and error, but through it all he has profited from experience and so at last has blazed a trail that points to a greater prosperity for an old land that has known so many fortunes and misfortunes.

First, a half dozen pure bred bulls of the Hereford type were brought in from the North. Then it was decided to change entirely to Pole Herefords as dehorning cattle by using Pole bulls seemed simpler than to mechanically dehorn them. An early discovery was that Northern bulls will not thrive under coastal South Carolina conditions so that since then all bulls are brought in from other parts of the South. Finally, because enough good Pole bulls could not be obtained, a return was made to the regular Hereford type.

As the upland fields had not been maintained at a high degree of fertility the yield of corn was insufficient to fill the

silos. In the emergency, rapid growing sunflowers were planted-hundreds of acres of golden disks all following the sun -and these bridged over the years until crop rotation and the lavish application of home produced compost brought the land to a point where ten tons of corn silage, or thirty-five bushels, per acre are produced. At first the upright silos were used, but now these have been discarded for the more convenient and efficient trench silos. These silos have a capacity of 1600 tons. The water supply is from flowing artesian wells and from the clear fresh Combahee river. The stock farm includes 5,000 acres of fields, woods and open pastures.

The herd is maintained at a peak of about 1,300 head. This permits the composting of 100 acres each year so that the 300 acres planted in corn can be covered in three year rotation. The long growing season allows a hay crop of cow peas after corn that goes into silo, while velvet beans are planted in the corn that is left to mature in the field.

At first the steers were sold as two-

1 South Carolina Plantation Home.





A fine herd of livestock on an old Southern plantation.

year-olds weighing a thousand pounds—then it was found more profitable to sell them at twelve months weighing 600 pounds, finally Mr. Turner discovered that the cheapest pounds were the 400 put on at six months, so now the bulk of steers are sold when they attain this age and weight. When I recently visited the farm there were 650 grade cows and 23 pure bred bulls. From this number will be selected about 100 of the lighter ones of the breeding stock for feeding. This leaves about 550 that on natural pastures will maintain themselves in top condition the year round.

Having perfected a system that produces feed, fertilizer, and beef cattle, Mr. Turner has reduced the outgo to a minimum and his books prove that beef cattle can be raised in this region profitably, provided you know how to do it. And while a good calf crop with scrub stock in the old woods range was 20 per cent. the Combahee herds show a calf crop of 80 per cent and better. Mr. Turner ships most of his calves in November. In the spring he sells many feeders to Kentucky and other parts of the upper South. The specially fed steers that weigh 800-900 at one year go as beef cattle, bringing top prices at terminal and local stock markets. The list of prizes taken by Combahee cattle at state and county fairs and at stock shows is impressive.

In 1932 the Livestock Department of the Clemson College Extension Service promoted a tour of farmers and business men in order to acquaint them with what could be done with cattle in the Low country. The entire party of 300 was entertained by Mr. DuPont at a barbeau dinner under the live oaks overlooking the Combahee. Mr. Turner escorted the party through his stock farm, showing with just pride his herd of fine beef cattle, and explaining in detail his methods and system. Among the interested guests was L. S. Mitchell who had recently moved to Colleton County from Minnesota. Reared in a beef cattle and dairy country he had been impressed in his new home by long growing seasons, cheap pasture lands, and the fact that there was an almost total absence of stock raising.

"I had inquired for some good nine hundred pound three-year-old steers from a native 'free range' stock man but was told that the nearest he could come to it would be three hundred pound nine-year-



olds." But here at the DuPont farms on the Combahee, Mr. Mitchell caught a vision that he has never lost—"The Southeast is destined to be a cattle country."

He promptly procured some pure bred bulls, secured a good herd of local cows, fenced in pasture lands, planted grains, established some permanent pastures and seriously and scientifically entered the cattle business. Progressive and alert native farmers and landowners, also inspired by the DuPont example, and encouraged by the efficient Clemson extension men, did likewise. Their success spread the good news that high grade beef cattle can be raised, and raised profitably, in a land that, with long open seasons and abundant grazing lands, had, since the dawn of history been but the haven of scrubs and razor-backs—a survival of the unfittest so far as man's wants are concerned. Now, with the cattle tick gone, with intelligent selection and care of live stock, the land at last came into its own.

With E. A. Mervin and L. Litchfield, both now successful Colleton stock raisers, Mr. Mitchell organized the Walterboro Livestock Market. Sales are held on alternate Thursdays. The yards are on U.S. Highway 15, two miles north of the town. Direct lines of paved roads radiate north, south, and west, so that live stock is assembled from the eight counties forming the southern corner of the state. Buyers come from Charleston, Sayannah, Columbia, the Piedmont cities, while even points as distant as Baltimore, Atlanta and Philadelphia are represented. Prices ob tained compare favorably with the terminal markets, for transportation by truck is rapid and economical.

There are many active local buyers, not only for butcher stock but often a farmer with large pasturage but few cattle will load his truck with feeders or pigs. Virginia and Tennessee buyers are found here in early spring seeking feeders; they pasture them on their rich grass through the summer, finish off in the feed lot, selling the finished beef stock the next spring. Many pig men come from the Piedmont cotton mill towns and buy truck

(Continued on page 50)

The Timber Resources Of The South

Part II

Last month the Manufacturers Record published the first part of this article and already it has been accepted as an important contribution to the existing knowledge of Southern forest resources. The information here presented is new and has never been published elsewhere. For the benefit of interested individuals and organizations, reprints are available at 10 cents apiece—Editor, Manufacturers Record.

Louisiana

The forest land of 16,210,000 acres in Louisiana amounts to slightly more than half the total land area of 29,062,000 acres. Of this forest area, commercial forest covers 16,185,000 acres including 10,055,000 acres of sawtimber.

This sawtimber area comprising 42,425,000,000 board feet is made up of 16,810,000,000 board feet of softwoods and 25,605,000,000 board feet of hardwoods. In softwoods old growth accounts for 4,400,000,000 board feet and 12,420,000,000 board feet are second growth. In hardwoods 13,910,000,000 board feet are old growth, and second growth occupies 3,340,000 and 6,710,000 acres respectively. By far the most important specie is yellow pine with 15,160,000,000 board feet. The only other softwood in quantity is cypress with 1,345,000,000 board feet

Among hardwoods, oaks amount to 9,085,000,000 board feet while a miscellaneous group make up 7,670,000,000 board feet: red gum is figured at 4,710,000,000 board feet, and tupelo and black gum, 3,830,000,000 board feet.

On the cordwood area of 2,045,000 acres are 9,325,000 cords—2,130,000 cords of softwood and 7,195,000 cords of hardwood. To this should be added 74,580,000 cords on the sawtimber area, of which 58,905,000 cords are hardwood and 15,675,000 cords are softwood, making a total supply for the state of approximately 84,000,000 cords if the supply on restocking areas be included.

Mississippi

Of Mississippi's 29,672,000 acre land area, forest land covers 15,875,000 acres of which 15,860,000 acres is described as commercial forest land.

The total saw timber area consists of 8.325,000 acres or 1.885,000 acres old growth and 6,440,000 acres second growth. Otherwise expressed, softwoods claim 16,910,000,000 board feet (3,160,000,000 board feet old growth and 13,750,000,000 board feet second growth) and 19.025,000.-000 board feet are hardwoods (6,800,000,-000 board feet old growth and 12,225,000,-000 board feet second growth), making a total of 35.935.000.000 board feet supply of saw timber. Yellow pine outranks all other woods with 15,890,000,000 board feet, and 285,000,000 board feet of cypress is the only other softwood of importance. The two principal species of hardwoods are oaks and red gum measuring 6,160,-000,000 and 5,930,000,000 board feet respectively. Miscellaneous hardwoods comprise 5,815,000,000 board feet followed by tupelo and black gum, 1,920,000,-000 board feet; cottonwood, 726,000,000 board feet; and yellow poplar, 475,000,-000 board feet.

The state's total supply of cordwood is 72,405,000 cords, 56,935,000 cords of which are located on the saw timber area—13,-265,000 cords of softwood and 43,670,000 cords of hardwoods. The remaining quantity is divided between some 1,290,-000 cords on restocking areas and 14,180,-000 cords (4,465,000 cords of softwoods and 9,715,000 cords of hardwoods) on a cordwood area of 3,115,000 acres.

The South is rich in hardwoods and has about 172,000,000,000 board feet in saw timber and over 564,000,000 cords of cordwood

North Carolina

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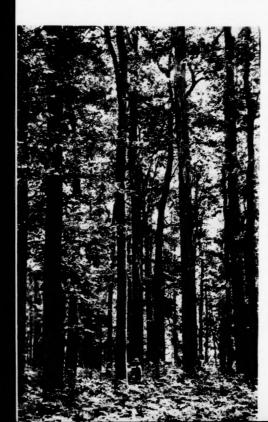
Almost 60 per cent of North Carolina's entire land area of 31,194,000 acres is classified as forest land and of this more than 18,160,000 acres are in commercial forest.

The saw timber area consisting of 9,-045,000 acres and bearing 43,080,000,000 board feet is made up of 2,265,000 acres of old growth and 6.780,000 acres of second growth. Softwoods, comprising 6,570,000,-000 board feet old growth and 21,200,000,-000 board feet second growth, total 27,-770,000,000 board feet while 7,850,000,000 board feet of old growth and 7,460.000.-000 board feet second growth give a total of 15,310,000,000 board feet of hardwoods. Southern yellow pine measures 25,520,-000,000 board feet and cypress 1,070,000,-000 board feet which, together with 540,-000,000 board feet of hemlock, 160,000,000 board feet of white pine, and 480,000,000 board feet of miscellaneous, make up the softwoods. Hardwoods include 4,705,000,-000 board feet of oaks, 2,690,000,000 board feet of tupelo and black gum, 2.475,000,-000 board feet of red gum, 1,375,000,000 board feet of yellow poplar, and 4,065,-000,000 board feet of miscellaneous.

The total cordwood volume measuring 85,990,000 cords consists of 66,140,000 cords (25,445,000 cords of softwood and 40,695,000 cords of hardwood) on the saw timber area, 18,560,000 cords (7,060,000 cords of softwood and 11,500,000 cords of hardwood) on a cordwood area of 4,780,000 acres, and 1,290,000 cords on restocking areas.

Oklahoma

The principal source of commercial timber in Oklahoma is an area of 5,845,-000 acres in the southeast corner of the state. Of this area, 4,235,000 acres are regarded as forest land and all but 10,000 acres of the latter are regarded as commercial forest. However, saw timber occupies only 1,925,000 acres bearing 4,090,-000,000 board feet. Old growth covers 475,000 acres supporting 1,160,000,000 board feet of softwood and 500,000,000 board feet of hardwood while second growth on 1,450,000 acres includes 1,475.-000,000 board feet of softwoods and 955,-000,000 board feet of hardwoods. The total supply of softwoods and hardwoods is 2,635,000,000 and 1,455,000,000 board feet respectively. Among softwoods, Southern pine is almost supreme since a miscellaneous group together make up the balance of less than 10,000,000 board feet. Oaks predominate among the hardwoods



with 975,000,000 board feet followed by 90,000,000 board feet of red gum, 55,000,000 board feet of tupelo and black gum, and 335,000,000 board feet of mixed hardwoods.

On the cordwood area of 1,040,000 acres there are 705,000 cords of softwood and 3,460,000 cords of hardwood or a total of 4,165,000 cords. But to this sum should be added 650,000 cords on restocking areas and 6,050,000 cords (1,700,000 cords of softwood and 4,350,000 cords of hardwood) on the saw timber area, thus making a total supply of 10,865,000 cords.

South Carolina

More than 10,730,000 acres of South Carolina's 19,517,000 entire land area is forest land, and of the former amount, commercial forest occupies 10,705,000 acres including 6,220,000 acres of saw timber and 1,905,000 acres of cordwood. Old growth saw timber covering 1,605,-000 acres has a stand of 5,610,000,000 board feet of softwood and 6,090,000,000 board feet of hardwood, while second growth saw timber on 4,615,000 acres measures 14,415,000,000 board feet of softwoods and 4,200,000,000 board feet of hardwoods. Together, softwoods consist of 20.025.000.000 board feet and hardwoods 10,290,000,000 board feet, making a total of 30,315,000,000 board feet. Except for 1,390,000,000 board feet of cypress and 95,000,000 board feet of miscellaneous, all the softwood (18,540,000,000 board feet) is in Southern pine. Hardwoods are well distributed with red gum, 2.955.000.000 board feet: tupelo and black gum, 2,500,000,000 board feet; oaks, 2.-240,000,000 board feet, and yellow poplar, 830,000,000 board feet. Mixed hardwoods make up the balance of 1,765,000,000

On the cordwood area is 4,260,000 cords of softwood and 3,730,000 cords of hardwood or a total of 7,990,000 cords. But to this should be added 15,575,000 cords of softwood and 28,695,000 cords of hardwood, together totaling 44,270,000 cords on the sawtimber area, besides nearly 1,000,000 cords on restocking areas, thus giving a total state supply of approximately 53,260,000 cords.

Tennessee

Nearly 50 per cent of Tennessee's total land area of 26,679,000 acres is classified as forest land. This area comprising 12,820,000 acres supports a commercial forest area of 12,555,000 acres, including 470,000 acres old growth and 2,670,000 acres second growth saw timber, or a total of 3,140,000 acres, plus 6,275,000 acres of cordwood.

The saw timber area bearing 16,950,000,000 board feet is made up of 3,400,000,000 board feet of softwoods (750,000,000 board feet old growth and 2,650,000,000 board feet second growth), and 13,550,000,000 board feet of hardwoods (4,



There are more than 196,000,000,000 board feet of Southern pine in saw timber on the commercial forest lands of the South

030,000,000 board feet old growth and 9,-520,000,000 board feet second growth). Southern yellow pine accounts for 1.980,-000,000 board feet of softwoods, while other important softwoods include cypress (330,000,000 board feet), hemlock (320,000,000 board feet), white pine (220,-000,000 hoard feet), and miscellaneous softwoods (550,000,000 board feet). Most outstanding among the hardwoods are oaks with 7,900,000,000 board feet, followed by yellow poplar having 1,350,000,-000 board feet. The remaining hardwoods are: tupelo and black gum, 740,000,000 board feet: red gum, 650,000,000 board feet; beech, birch, and maple, 210,000,000 board feet; and miscellaneous, 2,700,000,-

The cordwood area comprises 4,337,000 cords of softwood and 17,250,000 cords of hardwood or a total of 21,587,000 cords. In addition, on the saw timber area there are 6,600,000 cords of softwood and 26,400,000 cords of hardwood or a total 33,400,000 cords, making a grand total of 54,587,000 cords on all commercial forest land except a few thousand on restocking areas.

Texas

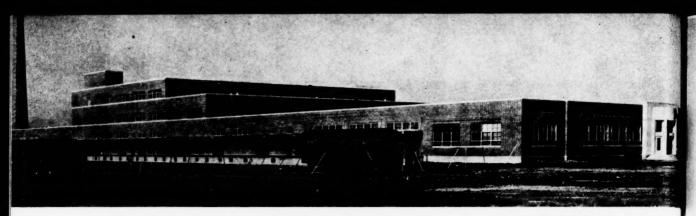
The part of Texas usually regarded as being forested is a total area of some 36,-825,000 acres in the eastern section of the

state. However, this is also the most densely populated and consequently forest land embraces only 15,315,000 acres and the area described as commercial forest is limited to 10,805,000 acres with saw timber occupying 7,160,000 acres and cordwood 1,480,000 acres.

The sawtimber stand of 28,500,000,000 board feet includes 18,405,000,000 board feet of softwood and 10,095,000,000 board feet of hardwood. Old growth on 1,-470,000 acres is divided between 3,445,-000,000 board feet of softwood and 4,-610,000,000 board feet of hardwood while second growth on 5.690,000 acres includes 14.960,000,000 board feet of softwood and 5,485,000,000 board feet of hardwood. Yellow pine is the predominant specie with 18.190.000.000 board feet, and cypress (200,000,000 board feet) is the only other softwood existing in any quantity. Among hardwoods the most important variety are oaks, 5,075,000,000 board feet, the remainder being red gum-2,110,000,000 board feet, tupelo and black gum-925,000,000 board feet and mixed hardwoods-1.985.000,000 board feet.

Cordwood in the amount of approximately 55,000,000 cords is made up of 6,-985,000 cords (2,750,000 cords of softwood and 4,235,000 cords of hardwood) on the cordwood areas, over 500,000 cords

(Continued on page 52)



The Coca Cola Company's new Dallas, Tex., syrup plant has recently been completed and occupies approximately 10 acres of a 23-acre site.

Five Months' Construction High for Thirteen Years as May Total Reaches \$112,911,000 Record

VALUATION of construction contracts awarded so far this year for projects located throughout the sixteen states of the South is greater than for any similar period since 1926. The current \$393,476,000 total, brought to this thirteen-year high by the May figure of \$112,911,000, is forty-three per cent ahead of the total for the first five months of last year.

Public construction and building make up a large proportion of the value of work placed under contract this year, with a little less than one-half of the public total being building projects and the balance engineering construction and highway work. Private construction and building contributed the remaining twenty-nine per cent.

Totals for the various types of projects, as classified in the daily reports issued by the Construction magazine, together with the percentages of the 1939 figure represented by each are: Private building. 872,253,000, 18%; Industrial.

\$42,751,000, 11%; Public building, \$125,829,000, 34%; Public engineering projects, \$71,983,000, 18%, and Highway and bridge work, \$80,660,000, 20%.

May's \$112,911,000 total is the highest contracts in this month have ever reached, as far as the records show, Public building was strong during the month. the \$28,603,000 for this kind of work being thirty-four per cent of the total. Highway and bridge work was the other major factor in raising the May total to its peak level. Twenty-nine per cent of the \$112,911,000 was represented by contracts involving improvement of the South's highway system. Private building totaling \$15,434,000 was a slight increase over the valuation placed on such work in the preceding month. Engineering construction also was higher, although industrial contracts showed a de-

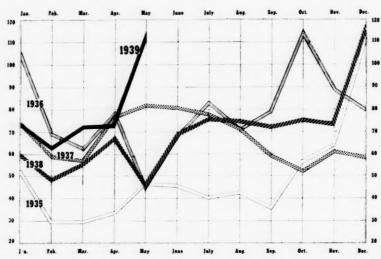
The largest industrial construction expenditure under a contract announced during May will be made at Mobile, Ala. Industry moves to establish important units—

Rubber, paper, shoe, steel, and textile concerns on active list—

Hollingsworth & Whitney Co., Boston, Mass., manufacturers of white paper. will put \$5,000,000 into the deep South's first plant to produce white paper and pulp. The Rust Engineering Co., industrial construction concern of Pittsburgh, Pa., received the award. Bids were opened about the middle of May for construction of additional facilities at the Alabama State docks, also located at Mobile.

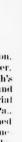
B. F. Goodrich Co., of Akron, Ohio, broke ground at Clarksville, Tenn., for a \$1,500,000 plant for the manufacture of mechanical rubber goods. The company already operates the Martha Mills, at Silvertown, Ga., where approximately 125,000 bales of cotton are used in turning out fabrics for Goodrich rubber products. The Clarksville building will be 1,000 feet long, 200 feet wide and contain 200,000 square feet of floor space. It will (Continued on page 34)

Left The high level of Southern construction activity during May is graphically shown in the chart, of monthly awards in millions of dollars. No other May has equaled the \$112.911.000 total, as far as records show. Few months have topped it within the last decade.



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May Construction Reaches \$112,911,000

(Continued from page 32)

be of concrete, stone, glass and steel construction, air conditioned. A garage and steam power plant also will be built, and an emergency hospital installed.

Bata Shoe Co., Inc., Czecho-Slovakian firm which several years ago acquired 2,000 acres of land near Belcamp, Md., proceeded with plans for erecting a shoe manufacturing plant. Announcement of award of the contract is shortly expected. The building will be five stories high, contain 75,000 square feet of space and be erected of brick and concrete. Fifty dwelling units are also part of the proposed development. Forty of these will be double family houses; ten, for single families. The temporary road construction is being done by T. B. Gatch & Sons, Baltimore contractors.

Consolidated Engineering Co., Baltimore contractor, which also bid on the Bata plant, submitted the low proposal for erecting the proposed Towson laboratory of Julian P. Friez & Sons, a division of the Bendix Corporation. Cost of the plant, for which Glidden & Baldwin, of Baltimore, are the architects, is estimated at \$500,000. Included in the development to be located on a recently acquired 18-acre site north of Baltimore are a main one-story unit 80 by 400 feet with a 100 by 100-foot wing extension and several smaller structures.

American Viscose Co. let the contract to John P. Pettyjohn & Co., Lynchburg, for five additional buildings at Nitro, W. Va., including an acid recovery structure, tank room, laboratory, carpenter and machine shop and additions to existing departments. Ballinger Co., of Philadelphia, are the architects and enginers. E. I. du Pont de Nemours & Co., of Wilmington, Del., announced its intention to erect an ethylene glycol plant at Belle, W. Va., with production expected by 1940. This company will spend from 28 to thirty million dollars this year for extensions and betterments at its various points of operations.

American Rolling Mill Co., of Middletown, Ohio, awarded the contract for a coal tipple at Huntington, W. Va., with construction soon scheduled to get under way on a program for the Peerless Coal and Iron Co., at Marlinton, W. Va. Revised plans and specifications for the plant will be distributed to receive bids by June 20. Ore stripping operations have already been started, so that a large store of ore will be on hand when the furnaces are completed.

Construction was started at Elkin, N. C., by Frank L. Blum, Winston-Salem contractor, on the \$500,000 plant for the Chatham Manufacturing Co. The program includes 160,000 square feet of floor space for a new finishing plant; 90,000 square feet of warehouse space; new boiler, filter plant and storage reservoir installations. The dry finishing building will be four stories high, 75 by 380 feet; wet finishing building, 92 by 320 feet; shipping building, 75 by 200 feet. The

three-story warehouse will be 320 by 85 feet. All will be of brick, steel and reinforced concrete construction.

The Mid-Continent Peteroleum Corp., has awarded construction of its \$800,000 refinery at Tulsa, Okla., to M. W. Kellogg Co., of New York. General Atlas Carbon Co., has a site at Guymon, Okla., for a large compressor station.

James Stewart & Co., New York, received the contract for the big addition to the Hanes Hosiery mill at Winston-Salem, N. C. Designed by Albert Kahn, Inc., industrial architects and engineers of Detroit, the structure will be 250 feet square, three stories high, have a monitor roof, walls of brick, structural tile and cement, floors of concrete.

M. J. Grove Lime Co., of Lime Kiln, Md., plans to lay out \$250,000 for developing a quarry and lime plant at Middletown, Va. A \$100,000 milk processing plant is to be erected at Christiansburg, Va., by Southern Dairies. To replace a burned plant, the 83 by 153-foot building will be erected of concrete and steel with glass brick panels. Its processing room will have a tile floor and glazed brick walls. Plans were prepared by Eubank & Caldwell, Roanoke architects.

Lundoff-Bicknell Co., Chicago, has the contract for a \$100,000 warehouse addition at the Houston, Tex., plant of American Can Co. The building will be one story, 207 by 165 feet, with steel frame and sash, brick walls, of factory type design. Wackman Welded Ware Co., of St. Louis, Mo., took an option on a site at Lake Charles, La., for erection of a \$100,000 plant for producing steel barrels and drums. The building would be 600 feet long, one story high, of fabricated steel construction.

E. E. Weddle & Co., received the award for a \$100,000 bakery for Nolde Brothers at Norfolk, Va. McCormick Co., Pittsburgh architects, prepared the plans for the 129 by 255-foot building, which will be erected of brick and steel, have a slag roof, wood floors and include a garage for trucks. Kroger Grocery & Baking Co., of



Link-Belt Co., Chicago manufacturer of elevating, conveying and power transmission equipment, has awarded contract for erecting the new Dallas warehouse pictured above. To be one story high, 105½ feet wide by 225 feet long, the building will be equipped with automatic sprinklers, have air conditioned offices, be insulated against heat, street and manufacturing noises.

Cincinnati, Ohio, started work on a \$100.000 peanut shelling plant at Montezuma, Ga. The building will be 45 by 75 feet with offices, 20 by 40 feet. Capacity is placed at 6,000 tons yearly. Link-Belt Co., Chicago, Ill., announced that Morris-Quillin, Dallas, would erect a new office and warehouse in the Texas city. To be erected of concrete, brick and steel, the new building will be 105½ by 225 feet long, contain automatic sprinkler equipment, air conditioned offices, be insulated against heat, street and manufacturing noises. J. A. Pitzinger and Roy E. Lane, Dallas, are the architects.

Expansion in the paper manufacturing industry came up again with a small addition to be erected to the Franklin, Va., plant of the Chesapeake-Camp Corp., and plans in the process of formulation by the Kieckhefer Container Corp., for what is reported to be a \$1,000,000 program at its new plant at Plymouth, N. C. Z. Turner Construction Co., of Suffolk, Va., holds the Chesapeake-Camp contract. No definite information is available on the Kieckhefer extension, according to an announcement by H. M. Kieckhefer, its secretary-treasurer.

Statistics of South's Construction

PRIVATE CONSTRUCTION BUILDING	Contracts Awarded May	Contracts to be Awarded , 1939	Contracts Awarded First Five Months 1939
Assembly (churches, theatres, auditoriums, fraternal)	\$2,641,000	\$2,396,000	\$6,805,000
tions, garages, etc.) Residential (apartments, hotels, dwellings) Office	3,259,000 $9,137,000$ $397,000$	2,562,000 7,439,000 330,000	$\begin{array}{c} 12,223,000 \\ 41,927,000 \\ 11,298,000 \end{array}$
	\$15,434,000	\$12,727,000	\$72,253,000
INDUSTRIAL	\$12,551,000	\$34,507,000	\$42,751,000
PUBLIC CONSTRUCTION BUILDING			
City, County, State, Federal Housing Schools	\$24,085,000 10,636,000 3,882,000	\$40,821,000 4,090,000 9,398,000	\$64,010,000 22,175,000 39,644,000
	\$38,603,000	\$54,309,000	\$125,829,000
ENGINEERING			
Dams, Drainage, Earthwork, Airports Federal, County, Municipal Electric Sewers and Waterworks	\$4,780,000 5,833,000 2,659,000	\$14,141,000 8,742,000 18,318,000	\$28,585,000 28,830,000 14,568,000
	\$13,272,000	\$41,201,000	\$71,983,000
ROADS, STREETS AND BRIDGES	\$33,051,000	\$41,587,000	\$80,660,000
Total	\$112,911,000	\$184,331,000	\$393,476,000

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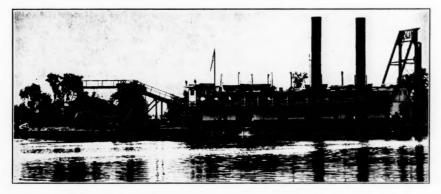
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B.F. Goodrich Company to Build Rubber Factory in Tennessee

A. R. Matthews*

THE Chamber of Commerce of Clarksville, Tennessee, has announced that the B. F. Goodrich Company, oldest major rubber concern in the United States, will proceed immediately to build a mechanical rubber goods plant in that town. Clarksville, with a population of 9,200, is situated 45 miles northwest of Nashville on the Cumberland River.

Decision of the company to build in the South was the culmination of more than a year of intensive studies and industrial surveys looking to the further development of production facilities of the greatest long-range value.

Long before the active search began for a plant site, a clear-cut conception of the desired location had been established by the Goodrich management. The aim was to have the Mississippi River on the west, Chattanooga on the south, Evans-ville and Owensboro on the north and North Carolina on the east. After studying a map, Clarksville appeared to fill the geographical bill. From that point company officials began their lengthy and detailed investigation of the region's assets.

At least three major considerations entered into the final selection of Clarksville as a logical and strategic location for the new \$1,500,000 rubber factory. In the first place, with mills and industrial plants today making greater use than ever of rubber equipment for improving technical operations, the rapidly increasing pace of southern industrial development offered a broad market for a company making a full line of mechanical rubber goods,

Classified as mechanical goods are innumerable rubber products. Among these are; rubber lining for tanks and valves; transmission, conveyor and elevator belting; gaskets, packing and molded goods; vibro-insulators which are capable of supporting and absorbing the constant jarring of 60 and 75-ton machines. Other products that will be made at the Clarksville plant include hose, batteries, soles and heels.

There are more than 34,000 manufacturing establishments in the South, with annual production worth somewhere in the neighborhood of \$10,500,000,000, and the bringing of a mechanical rubber goods plant to such a market seemed well advised.

A second consideration was nearness to raw materials, of which many are required besides rubber. Cotton is one of the most important raw materials for the rubber industry. Goodrich uses 125,000 bales annually on the average, all American-grown. The company at all times has buyers in the South selecting the best cotton available for the manufacture of "weftless" cords for tires. Cotton adds strength and durability to many other of the company's 32,000 rubber products, too.

Louisiana and Texas are leading producers of two other raw materials, carbon black and sulphur. The former, a product of natural gas, imparts toughness and durability to rubber compounds, while the latter is used for vulcanization.

Third, and certainly of considerable importance in the selection of the building site, was the matter of adequate transportation facilities. Two railroads, the Louisville & Nashville and the Tennessee Central, operate into Clarksville. An excellent highway system gives access to large southern cities, and the town has barge connections with the Tennessee and Mississippi Rivers. Thus the company will have ample choice of transportation media in the shipping of finished goods. At the same time, it will be possible to obtain raw rubber via the all-water route from the East Indies and South America.

Among other considerations which tipped the scales in favor of locating the plant in a southern state might be mentioned the availability of cheap and abundant water power and the availability of ample space for further expansion of plant as conditions warrant.

With the completion of the Clarksville

factory expected early next year, the company will have two plants located in the South. The other is Martha Mills at Sitvertown, Georgia, to which cotton is shipped to be converted on 120,000 spindles into weftless cord for use in the manufacture of tires.

The Goodrich company places strong emphasis on industrial research, and hopes to be of increasing assistance to southern engineers and plant operators in solving their technical problems. For more than 40 years the company has been ploughing back some of its earnings into the maintenance of laboratories and a well-equipped research staff, a policy which has resulted in the development and perfection of many new uses for rubber. On many occasions the company has cooperated with inventors, other industrial organizations, government and foreign representatives, in devising new rubber applications.

At the present time it is entering the field of synthetics following six years of research to develop a rubber-like material that has been named koroseal. One of the most important industrial applications for this new synthetic is in the wire and cable industry as an insulating and sheathing material. It also promises to expand the market for cotton through its ability to render fabrics waterproof, spotproof and odorless.

Construction of the new Clarksville plant is scheduled to begin immediately. It will be built on a 30-acre tract, allotted after a popular referendum in which voters overwhelmingly approved the project. 1,828 to 7. The modern brick and steel building will be 800 feet long, 200 feet wide and contain 200,600 square feet of floor space. Several hundred workmen will be employed on three 8-hour shifts, five days a week.

^{*}Head of Martha Mills, Silvertown, Ga., a subsidiary of The B. F. Goodrich Company.

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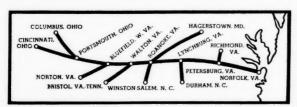
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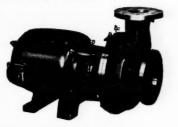
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Iron, Steel and Metal



Market

THE month closed with the steel industry operating at 52.2 per cent of capacity in contrast with 48.5 per cent the week before and 26.1 per cent a year ago.

Authorities believe the trend in the weeks ahead depends on the volume of specifications received to apply on orders taken recently at lowered prices. If efforts are successful to set a time limit both on specifications and deliveries on business taken at reduced prices, it will clear the way for activity on normal lines.

As the coal tie-up caused slowing down of steel activity, the settlement of the controversy must be credited with some of the increase in output noted above.

It is not recorded that at the reduced quotations for steel products obtainable in recent weeks there was noticeable improvement in volume of orders. On the contrary, in a number of instances where buying might have been expected, hesitation was seen probably from uncertainty about the point to which prices might descend.

The Price War

T. M. Girdler, retiring president of the American Iron & Steel Institute, expressed in his address to the Institute members at their New York meeting, his views concerning the recent price war. He said in part:

"The industry needs a clearer understanding of the vital necessity for profits. It needs to realize there is no glory in getting mere tonnage if the business is taken at a loss. The industry has seen its costs mount higher and higher and grow ever more rigid. It has seen the 'break-even' point soar to around 50 per cent of capacity, the highest in history. It has seen the attempt by government to make wage rates fixed and inflexible. And what has the industry done to meet these situations? It has brought down prices."

He recommended abolishment of the practice of announcing increases in prices weeks in advance of the effective date, while price changes downward go into effect immediately. In his opinion, ad-

vance notices of price increases operate as an artificial stimulant upon demand. Buyers rush in, placing tonnage ahead at the current low rate. The result is a spurt in activity, followed by a sharp decline which may have seriously adverse effects upon general business conditions.

Mr. Girdler did not pull his punches in his analysis of the causes for the continuance of depressed conditions in steel and industry generally. "After ten years," he said "the problem of restoring genuine prosperity and finding jobs for the unemployed remains acute and pressing. That is still true despite all the strange and fantastic nostrums that have been applied to the country's economy and despite the squandering of billions upon billions of dollars in the effort to spend our way out of the depression."

He referred to domestic policies which are leading "straight down the road" to dictatorship in the United States. The attack upon the profit motive he described as coming from those who would destroy the profit system essential to private enterprise which they would undermine or dominate and said it "comes from those who, for reasons of political opportunism, would hold up profits as a flag to incite class hatreds."

Pump Priming

In reference to the vast sums that have been spent in priming the pump, which "is still dry," he said there "is a wider distribution of poverty."

"Every intelligent individual must know that if the government persists in its present mad financial course it will surely and inevitably lead to uncontrolled inflation and vast economic disaster."

He paid his respects to the Wagner law in no uncertain terms in the following:

"Of all the monkey wrenches which have been thrown into the industrial machine, the most harmful is the so-called Wagner Act. The major contributions of that law and its administration by a biased board have been industrial confusion and demoralization."

Fortunately for the well-being of the country, Mr. Girdler saw fit to depart from practices all too common on the part

of business men during the crisis which has faced the country of keeping silent when they should be outspoken in defense of what they know to be right, and in criticism of what they know to be wrong.

Ernest T. Weir, Chairman of the National Steel Corporation, was elected to the presidency of the Institute, succeeding Mr. Girdler.

The View of This Column

It is not within the province of this column, ordinarily, to do more than set down conditions in iron and steel as they exist, but the opinion is held that the industry is fortunate in having a successor to the presidency, following the two consecutive terms of forthright leadership of Tom M. Girdler, in the person of a man of the experience and force of Ernest T. Weir.

In the light of Mr. Weir's course under previous attacks upon his company's dealings with its employees, it may be taken for granted that he will entertain no false notions about the virtue of silence when speech is necessary; and it may be added that if ever spokesmen were needed for industry, they are needed today. The policy of silence under great wrong has gone on long enough. As pointed out elsewhere in this issue, it is time for private business to be heard in defense of its rights and in protest against iniquitous laws that have hamstrung it.

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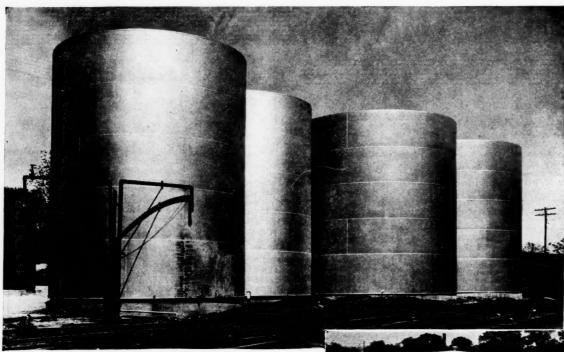
Birmingham Production

Birmingham operations have advanced to 63 per cent of capacity in contrast with the production rate of 57 per cent since April.

Another open hearth furnace and two blast furnaces have been placed in operation by the Tennessee Coal, Iron and Bailroad Co.

New business for the district includes orders for 100 hopper cars and 10 flat cars placed with the Pullman Standard Car Co. at Bessemer by the Birmingham-Southern Railroad. Several pipe orders have been received from the Pacific Coast.

The steel industry had a total enrollment of employees of 452,000 in April compared with 445,000 in April, 1938,



STORAGE FACILITIES at a modern cotton oil mill

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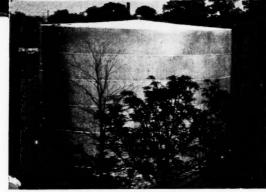
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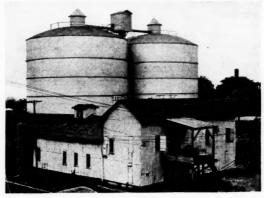
Modern storage facilities at the Uniontown (Ala.) Cotton Oil Company mill are shown in the illustrations on this page. Adequate capacity for the storage of oil is provided in five welded steel tanks. This type of construction provides smooth joints that are easy to clean and paint. It eliminates leaks caused by uneven settlement.

Steel tanks are also used for the storage of cottonseed. They are built with air ducts in the floors so that the contents can be ventilated easily and thoroughly. Even though the seed has a high moisture content it can be kept in first class condition in these tanks by drawing air down through the mass. They are 60 ft. in diameter and have self-supporting roofs, with no supporting framework to interfere with the movement of the seed.

In addition to flat-bottom storage tanks, we build elevated water tanks in a complete range of standard sizes for general service or fire protection. Also pressure tanks of all kinds, steel bins, gasholders, carbon dioxide towers, digesters, and other steel plate work. When contemplating the installation of any work of this type, write our nearest office for quotations.



Top: Four cotton oil tanks 30 ft. high. Above: 10,000-bbl. cotton oil tank.



Two 60 ft. diameter cottonseed tanks at the Uniontown Cotton Oil Company mill.

CHICAGO BRIDGE & IRON COMPANY

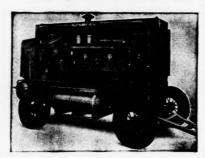
Birmingham 1530 North Fiftieth Street New York 3313-165 Broadway Bldg. Philadelphia 1619-1700 Walnut Street Bldg. Dallas 1408 Liberty Bank Bldg. Cleveland 2216 Rockefeller Bldg. Detroit 1510 Lafayette Bldg. Houston 2919 Main Street Chicago 2106 Old Colony Bldg. Boston 1510 Consolidated Gas Bldg. Tulsa 1611 Hunt Bldg. San Francisco 1040 Rialto Bldg. Havana Edificio Abreu 402

New Ways

of Doing Things

Portable Diesel-Driven Compressor

Announcing a new development in its Class WO-2 Portable Diesel-Driven Compressor, the Chicago Pneumatic Tool Company of New York, N. Y., declares that the new machine has an actual capacity of 700 cubic feet per minute and meets a demand for a compact, highly efficient Diesel-driven portable compressor much larger than heretofore available.



CP 700-Cubic-Foot Portable Compressor

Class WO-2 Compressor consists of the Chicago Pneumatic Type 48 vertical, four-cycle, medium speed Diesel engine on a common crankcase and crankshaft with a "V" type two-stage, double-acting, water-cooled compressor, together with suitable cooling systems and air receiver, all on a structural steel deck and forming a complete, self-contained portable unit. The new compressor is described in detail in Bulletin No. 762—second edition—and the CP Type 48 Diesel Engine is described in Bulletin No. 768.

Simple Taper Point-Puller

The Progressive Welder Company, Detroit, Mich., has introduced a simple taper point-puller for hydromatic and multiple spot welders, which is designed to eliminate damaging the welding point seats. Important features of the puller are: automatic locking—no slipping or scoring of the electrode; positive grip, instantaneous operation, straight-line pulling action, and light weight. The pullers are available in sizes to take care of points with Morse No. 1, No. 2, or No. 3 taper.

Taking Fatigue Cracks From Piston Pins

The formation of fatigue cracks in piston pins has been virtually climinated by a well-known automobile company, it is declared, by the simple expedient of finish broaching and burnishing the bores of the wrist-pins. The operation, performed on a Colonial Utility broaching machine with hydraulic automatic index table designed for continuous cycle, is very fast, the production being about 1400 pieces per hour. The Colonial Utility broaching machine is manufactured by the Colonial Broach Company of Detroit, Mich.

Continuous Textile Bleaching Process

A new continuous bleaching process for textiles, employing peroxide as the basic reagent, has been announced by The R. & H. Chemicals Department of E. I. du Pont Nemours & Company of Wilmington. Del. The process has been successfully applied to cotton piecegoods lighter than sheeting, while market whites, dye-bottoms and colored yarn materials have also been handled with equal versatility. it is declared. The bleaching unit consists of an upright stainless steel chamber constructed in such manner that very efficient utilization of chemicals is obtained. with savings of steam, labor and water. Process and equipment patent coverage has been applied for, the new equipment to be constructed by manufacturers of textile finishing machinery.

PROTECTOMOTOR Air Filter

Embodying the principles of the well-known Protectomotor, a new PROTECTOMOTOR air filter for small internal combustion engines, compressors, pumps and all "air-breathing" machines, is being manufactured by Staynew Filter Corporation, Detroit, Mich. Designated as Protectomotor Model E, the new filter is protected against weather conditions by a heavily enameled steel housing opening at the bottom. The housing is of pressed metal construction, less expensive than the housing of the former Model C Protectomotor which it supersedes.

Towmotor Car Loaders for Fast Service

Designed and built for faster car loading, as well as for other material handling operations, Model CL Towmotor Co., Cleveland, Ohio. This new Towmotor is built with a shorter wheelbase — 47 inches—and with either single or telescopic mast. It has a load capacity of 4000 pounds and may be equipped with forks, flat plate or ram. The most impor-

Lufkin Introduces Rugged Rule No. 46

Designed to overcome a common complaint that such rules break easily, an extra sturdy six-foot folding wood rule has been introduced by The Lufkin Rule Company of Saginaw, Michigan, manufacturers of measuring tapes, tape-rules, rules and precision tools. The new rule, designated Rugged Rule No. 46, is made of tough, hardwood sections of extra thickness, 36 inch, while the smoothworking spring joints are brass plated and have patented locks to maintain accuracy. It has brass strike plates which prevent wear of sections in opening and classing.

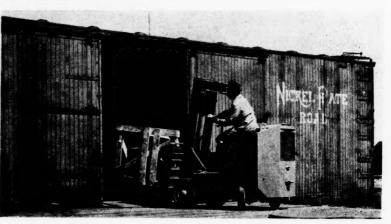


Lufkin Rugged Rule No. 46

Bailey Flow Recorder

Bailey Meter Company, Cleveland, Ohio, has developed a new Flow Recorder to record instantaneous values of rate of flow as measured by displacement meters. The device, employing the Bailey Synchrometer electrical transmitting method, differs from the usual flow recording attachment for displacement meters in that it draws a graph of rate of flow against time instead of simply recording total flow over a given time.

tant difference is its shorter length and ability to turn in smaller radius, making it more flexible and faster for loading and unloading box cars. All vital operating parts are standard and interchangeable with other models. The unit features front wheel driving with rear wheel steering, smooth hydraulic lift and seated center control — features which have been pioneered by Towmotor for six years. Brake drums are turned in the wheels themselves. Driving wheels are doublettred, and the gasoline consumption average is one-half gallon per hour.



PRODUCTS WELDED OR RIVETED

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This applies to field as well as shop built equipment.

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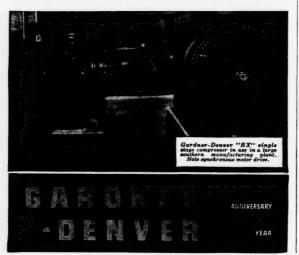


"IN ALL 7 OF OUR PLANTS WE USE GARDNER-DENVER AIR COMPRESSORS!"

-says southern manufacturer

● Here's a southern manufacturer who operates 7 large plants—and every one of those plants is equipped with one or more Gardner-Denver air compressors! The photograph below shows one of his latest Gardner-Denver purchases—a Gardner-Denver 14 x 13 "RXE" single cylinder compressor. This compressor operates 8 hours a day, 44 hours a week, furnishing compressed air to air routers, air rubbers, paint spray guns, air cleaning nozzles, etc. Capacity is 450 cu. ft. per minute actual air delivery at 100 lb. pressure.

There's a reason for such overwhelming preference for GARDNER-DENVER air compressors. Gardner-Denver "RX" Single Stage Horizontal Compressors, for example, combine exceptionally low horsepower consumed per cubic foot of air delivered with exceptional dependability. One of the big advantages of these compressors is that they can be equipped with Duomatic control—an automatic device which regulates the running of the compressor in accordance with air needs, providing utmost economy of operation. We'd like to tell you the whole story of Gardner-Denver compressors and why they are especially suited for use in your plant. Write for Bulletin HAC-40! Gardner-Denver Company, Quincy, Illinois; Atlanta, Ga.; Birmingham, Ala.; Knoxville, Tenn.; Dallas, Tex.; Houston, Tex.; Washington, D. C.



» » » **Finance** « « « And kindred subjects

Secretary of the Treasury Suggests

Mr. Morgenthau has proposed certain changes in taxes as follows:

Repeal the remaining 2½ per cent undistributed profits tax. Provide for carrying over net annual business losses, deducting them from profits of future years.

Liberalize the present capital stock tax and excess profits levy.

Establish a temporary national committee to study and report to Congress on overlapping and competing Federal and State taxes.

Another suggestion of the Secretary of the Treasury seems to deserve prompt and favorable consideration. It is his idea that the Ways & Means Committee and the Senate Finance Committee meet jointly during each session of Congress to consider the expenditure and revenue programs of the Federal Government as preliminary consideration of these highly important matters should bring about a better coordination between the executive and legislative branches of government in tax and expenditure legislation.

Insurance Investments In Private Enterprise

The National Industrial Conference Board reports life insurance company investments in private industry in 1938 exceeded purchases of United States Government bonds for the first time since 1931.

Forty-nine life insurance companies added \$717,000,000 to their holdings in private corporate securities, contrasted with \$188,000,000 added to their holdings in United States Government bonds

These 49 companies hold approximately 92 per cent of the assets of such companies in the United States,

The Board reports the tapering off of insurance investment in government bonds, which began in 1937, as of great importance not only to private borrowers, but also to bankers as "banks are likely to be called upon to absorb a considerable part of the government bond issues previously taken by insurance companies."

The Board also believes that the Treasury and Federal Reserve authorities will, more than ever, try to keep the banking system of the country in condition to finance the federal deficits.

The opinion is expressed:

"If encouraged and helped to do so by the Federal Government, the banks of the country can keep adding to their bond investments almost without limit, but this can hardly be accomplished without a further inflation in bank credit."

Holding Back Investment

Lammot du Pont in a statement "To Stockholders, Employes and Friends of E. I. du Pont de Nemours & Company" answered the question of "what is holding back investment," to which reference is made in another column. He said:

Lasting confidence, necessary to free the capital goods industries and to re-employ millions of people, cannot develop under such conditions. New capital cannot be created. Capital which remains available for use in new enterprises is being paralyzed by fear and rapidly confiscated through the heavy burden of taxes.

The tremendous debt created and the heavy tax burden required have prevented the development of the confi-(Continued on page 44)

RICHMOND TAKES THE LEAD



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IN SOUTHERN INDUSTRY

Measured by the value of manufactured products or by the cost of materials used in manufacturing, as the case may be, Richmond now ranks first among the industrial centers of the South, according to the Richmond Chamber of Commerce.

Richmond's industrial production is valued at more than 337 million dollars, or 43 million dollars more than Louisville, the next highest city, and 185 million dollars more than Atlanta, the third city.

For many years First and Merchants has been the leader in supplying banking facilities for Richmond industry, as well as for manufacturing in many other parts of Virginia and the South. These facilities, therefore, are especially useful to any line of industry.

FIRST AND MERCHANTS National Bank of Richmond

JOHN M. MILLER, JR. Chairman of the Board

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H HITER HARRIS President

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By using Armco Zincgrip you are assured complete surface protection for your galvanized products or equipment. Under proper working practice corners and seams will be just as well protected, just as smooth as the flat parts. This way, Armco Zincgrip can do full justice to the design of your products.

Join the growing list of manufacturers who are getting such fine results with Armco Zincgrip. You can buy it in coils or sheets, with a choice of three base metals: durable Armco Ingot Iron, copper-bearing steel or open-hearth steel. A word from you about your possible applications will bring complete information. Your letter will get prompt attention. The American Rolling Mill Co., 1270 Curtis St., Middletown, Ohio.



"Finance and Kindred Subjects"

Holding Back Investment

(Continued from page 42)

dence necessary to resuscitate the capital goods industries and to induce the creation of new enterprises. Since the fiscal year 1932 the national debt, including "guaranteed" debt, has increased almost \$25,000,000,000.

Our spending program has produced, not recovery, but paralysis and fear. Is it not high time that we discard this program which bids fair to perpetuate our difficulties, and return to the time-tested method of encouraging and fostering the free play of fundamental economic forces, of encouraging men to work and capital to produce? Is it not evident that in this way only can true recovery be brought about?

Louisiana's Oil Reserves

The New Orleans Association of Commerce is authority for the statement that Louisiana is rapidly heading for third place in petroleum reserves in the United States. Figures of proven reserves jumped from 713,000,000 barrels January 1, 1938, to 1,040,000,000 barrels January 1, 1939, a net gain of 45 per cent after subtracting 1938 production.

The Banker's Problem

As the sum of idle money in the hands of banks continues to increase, excess reserves have reached record figures of \$4,300,000,000 and from present indications will grow higher. The banker's problem of how to get these excess funds working is a very real one. Business does not seem inclined to borrow for expansion, and it remains to be seen whether latest proposals for government guaranteeing 90% of new loans will cause the anticipated movement of funds.

T. V. A. And Tennessee Taxes

The House Military Affairs Subcommittee has been hearing testimony on a bill to enable the Tennessee Valley Authority to issue bonds to carry out its contract to purchase the property of the Tennessee Electric Power Co.

The question of how the taxes, which the private utility formerly paid, will be made up to the state and its subdivisions has not been answered, although the Tennessee Taxpayers' Association is understood to have withdrawn its objection to the bill, which in its present form does not provide for the TVA paying taxes equal to those paid by the private utility.

The Association is said to have been assured the TVA would cooperate to make satisfactory tax adjustments.

Mr. Wendell L. Willkie of the Commonwealth and Southern Corporation, testifying before the Committee, urged the passage of the bill on the ground that the value of the securities of approximately 20,000 investors would be destroyed if the contract was not carried out.

Reduction in North Carolina's Debt

Lewis and Hall, Inc., of Greensboro, North Carolina, investment brokers, call attention to the reduction in the state of North Carolina's debt in the last five years. The present total overlapping public debt of \$489,633,991, has been reduced by \$56,702,926 since 1934. In per capita figures this was a reduction of \$172 to \$140 in five years.

The state's debt alone is \$153,000,000; counties \$150,000,000; districts and townships \$23,000,000; cities and towns \$163,000,000. Total of all sinking funds is \$30,800,000, which is an increase of \$4,700,000 in five years.

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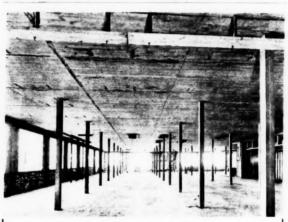
Georgia-Kincaid Mills Protected with over 160,000 sq. ft. of BUILT-UP ROOFS

This mammoth textile enterprise at Griffin, Ga., consists of six separate manufacturing units, covering over 30 acres. Carey Roofing Products have been adopted as standard, both for the mills and for the 400 operators' attractive cottages.

The flat roof surfaces are covered with Carey Asphalt and Asphalt Felt Specification Built-Up Roofs. Most of the cottages are roofed with Carey Double Coverage Asphalt Shingles.

Carey Roofs are backed by over half a century of roofing experience. Thousands of plant owners, like Georgia-Kincaid, have found that Carey Roofs last years longer—cost less per year. Whatever your roofing problem, put it up to Carey. No job is too big or too small. Service available through a nationwide organization. For complete details address Dept. 61.

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Minneapolis, Minn.

INDUSTRIAL NEWS

Dr. Jeffries Elected to Academy of Sciences

of Sciences

Dr. Zay Jeffries, eminent metallurgist, has been elected to membership in the National Academy of Sciences, according to a recent announcement. Limited to 350 members, the Academy occupies top rank among American scientific societies and compares with the Royal Society of Great Britain and the French Academy. As a result of recent research with tungsten lamp filaments, high strength aluminum alloys, and the application of X-ray analysis to metallurgy, Dr. Jeffries has contributed to numerous important developments in the science of metals. From 1932 to 1936, he served as president of Carboloy Company, Inc., of Detroit, Mich., and since 1936 has served as chairman.

Chemical Industries Exposition

New chemical products and materials of construction with examples of their latest applications will make the Seventeenth Exposition of Chemical Industries more interesting than its predecessors, it is declared. The exposition will be held at Grand Central Palace, New York, December 4 to 9, marking

the 25th year of service to the chemical and allied industries. The Advisory Committee will be headed by Dr. M. C. Whitaker, vice president of the American Cyanamid Company and a prominent figure in the chemical industry, The Exposition will be under the direction of Charles F. Roth, with executive offices at Grand Central Palace.

Eichenberger to New York Office

R. W. Eichenberger to New 10rk Office R. W. Eichenberger, Vice President of the Robins Conveying Belt Company, manufac-turers of material handling equipment, who formerly served as manager of the company's Chicago office, has been transferred to the New York office at 15 Park Row, where he will collaborate in general sales management for the company with H. Von Thaden, Vice President.

Weinheimer With Ironton Fire Brick

Ed. F. Weinheimer, formerly in the by-product coke department of Great Lakes Steel Corporation of Ecorse, Mich., is now repre-senting The Ironton Fire Brick Company of Ironton, Ohio, in Virginia, West Virginia, and Western Pennsylvania.



Write for your copy

Model Land Company

Flagler System St. Augustine, Florida

Kimball Made Executive Vice President of U. S. Steel

President of U. 5. Steel

President Benjamin F. Fairless of the
United States Steel Sorporation recently announced the election of G. Cook Kimball as
an executive vice president of the Corporation, with headquarters at its Chicago executive offices at 208 South LaSalle Street. Mr.
Kimball is well known in Chicago, having
been connected with the Illinois Steel Company and the Carnegle-Illinois Steel Corporation, United States Steel subsidiaries. He is a
graduate of Harvard University and began his
service with United States Steel subsidiaries
in 1901, a year after his graduation, when he
joined the engineering department of the
American Tin Plate Company.

Link-Belt's New Dallas Building

Link-Belt's New Dallas Building

Long identified with the Southwest in the manufacture and distribution of elevating, conveying and power transmission products, maintaining Southwestern headquarters in Dallas and a branch sales office in Houston, Link-Belt Company of Chicago, Ill., recently awarded a contract to Morris-Quillin of Dallas for the construction of a new office and warehouse at Latimer and Pierce streets, Dallas. The new building, to be of concrete, Drick and steel construction, will be 163½ feet by 225 feet, one story, fronting on Latimer street. In the design of the structure, much thought was given to insulation against heat and also against street and manufacturing noises. An automatic sprinkler system will be installed. The office, to be located at the front of the building, will be of modernistic design and air-conditioned. For the pressent a limited number of machine tools will be installed in the warehouse section to peruit certain machining operations and facilitate delivery of such stock parts as may require additional machine work to fit them for specific requirements. A private railroad siding is located on the south side of the building, with trucking and parking facilities on the north or Plerce Street side. Adequate ground has been provided for the expansion of manufacturing facilities. J. A. Pikinger and Roy E. Lane, of Dallas, are the architects for the structure.

Concrete Reinforcing Steel Institute

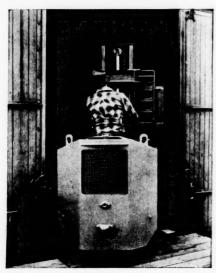
At the Fifteenth Annual Meeting of the Concrete Reinforcing Steel Institute, held at Augusta, Georgia, April 20-21, the following officers and directors were elected for the year. President, J. R. Fenstermaker, President, Hugh J. Baker and Company, Indianapolis: Vice President, J. F. Curley, Vice President, Connors Steel Company, New York; Vice President, George W. Connors, Jr., President, Connors Steel Company, Birmingham; Treasurer, E. W. Langdon, Manager Concrete Reinforcing Division, Joseph T. Ryerson & Son, Inc., Chicago; Directors, Blair M. Boissean, President, Virginia Steel Company, Richmond; H. E. Calves, Vice President, Taylor Davis, Inc. Philadelphia; H. G. Daly, President, Swift's Steel Company, Williamsport, Pa.; Ralph T. Rowles, Assistant General Manager of Sales, Jones & Laughlin Steel Corporation, Pittsburgh; F. II. Sparks, Sales Manager, Knoxville Iron Company, Knoxville; W. H. Stewart, Manager of Sales, Reinforcing Division, Truscon Steel Company, Youngstown; directors whose terms have not expired; Charles M. Gunn of Gunn, Carle & Company, San Francisco; H. D. Jolley, Vice President, Ceco Steel Products Corporation, Omaha; James D. Maitland, President, The Colorado Builders' Supply Company, Denver; John D. Roberts, Central Texas Iron Works, Waco; S. V. Taylor, Concrete Steel Fireproofing Company, Detroil, Mark Beeman resigned as Executive Secretary because of ill health, and Harry C. Dalzell, who has been identified with the Portland Cement Association for several years, was elected to succeed him.

Unique Method to Weigh Crane Units

Units

The Harnischfeger Corporation of Milwaukee, Wis., which has manufactured more than 10,000 overhead traveling cranes, has solved the problem of weighing shipping units in a novel manner. Scales operated by two men at each end of a girder, for instance, are hooked on two 20-ton cranes, which in turn lift the unit. With this simple and efficient method, Harnischfeger knows what every unit weighs separately and what the crane weighs completely assembled, thus enabling it to distribute the weight properly on the car when shipping and to know what facilities are needed to erect the crane when it reaches its destination.

(Continued on page 48)



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CAR LOADERS?





New Model C-L, 47" wheel base, load cap. 4000 lbs.

Carloading is not new to TOWMOTOR. For over 20 years TOWMOTOR Tractors have been used to push and pull freight in and out of box cars. For 6 years TOWMOTOR Lift Trucks have been doing it. Now TOWMOTOR offers a still shorter and more condensed lift truck for carloading, as well as other handling operations. The new Model C-L has a shorter—47"—wheel base with load cap. of 4000 lbs. Built with single or telescopic mast.

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INDUSTRIAL NEWS

(Continued from page 46)

Enters Variable Speed Transmission Field

With the announcement that it has become exclusive licensee for the manufacture and sale of the Graham unit—now to be called the Briggs & Stratton Variable Speed Transmission—the Briggs & Stratton Variable Speed Transmission—the Briggs & Stratton torporation, Milwauke, Wis., enters the variable speed transmission field. The company, widely known as manufacturers of small 4-cycle gas engines and automotive equipment, has been manufacturing the Graham Variable Speed Transmission for a year and a half for Graham Transmissions, Inc. Several new sizes are being added, the complete line to cover units from ½ to 10 horsepower, as well as a complete line of controls, including manual, remote mechanical, remote electrical, automatic, etc. L. A. Graham and A. Madle, formerly vice president and chief engineer, respectively, of Graham Transmissions, Inc., have Johned the Briggs & Stratton organization.

Carboloy Completes \$750,000 Plant

Carboloy Completes \$750,000 Plant
The Carboloy Company, Inc., of Detroit,
Mich., has opened a new plant and general
offices in Detroit, in which all its manufacturing facilities formerly located in Cleveland,
Ohio, Detroit, and Stamford, Conn., have
been consolidated. The new plant, the largest
cemented carbide plant in the Enited States,
embraces a total of 121,750 square feet. A
two-story administration building, with an
area of 35,556 square feet, houses all general
drafting, purchasing, accounting, etc. This
structure is of reinforced concrete, complete
ly air-conditioned, with acoustical ceilings in
halls and offices. The factory building, connected with the rear of the Administration
building, is a monitor-type, one story, allwelded, steel and brick frame structure covering an area of 88.197 sonare feet. It contains
complete facilities for the manufacture of Carboloy from the raw materials through to the
finished tools, dies and wear-resistant parts.
The cost of the new plant was about \$750,000.

Globe-Wernicke Steel Buildings

A prominent newcomer in the steel buildings field is the Globe-Wernicke Company of Cincinnati, Ohlo, one of the world's largest man-facturers of office equipment and supplies, and for many years an important manufacturer of steel and wood partitions for commercial and industrial use. In its new field, the company employs a type of construction that makes possible custom-built steel buildings from pre-fabricated stand units which are easily and quickly erected, according to President J. S. Sprott. This new exclusive method, it is declared, climinates waste and assures efficiency and economy.

Geist Made Vice President of **Allis-Chalmers**

Allis-Chalmers

The appointment of Walter Geist as vice president of Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has been announced by Max Babb, president of the company. Mr. Geist entered the employ of Allis-Chalmers as errand boy in the Saw Mill Engineering Department, advancing to draftsman and through various positions and departments. He originated the idea of the multiple V-belt drive principle of power transmission, known as the Texrope Drive, Originally conceived for the textile industry, this drive was found to have such broad application throughout industry generally that it has been widely adopted. Mr. Geist was made assistant manager of the Milling Department in 1928, and appointed General Representative in 1933, in which latter capacity he supervises the personnel of all district offices of the company, both domestic and foreign.

Blaw-Knox Pulp Digesters for Mobile Paper Plant

An order for four unusually large size pulp-digesters for use in the new kraft paper mill to be built at Mobile, Ala., by the Hollings-worth & Whitney Paper Company of Boston, Mass, has been placed with the Blaw-Knox Company of Pittsburgh, Pa. The digesters will be 47 feet long, 11 feet inside diameter, of all-welded construction, with X-ray inspec-tion of the welds. The yessels will be com-pletely annealed, and hydrostatically tested to a presseure of 300 pounds.

Revere Copper and Brass Appointment

Appointment

C. Donald Dallas, president of Revere Copper and Brass Incorporated, New York City, announces the appointment of C. H. Kuthe as Technical Advisor to the company's Michigan Division, with plant and headquarters at 5851 West Jefferson Avenue, Detroit Mich, Mr. Kuthe is an alumnus of Case School of Applied Science, receiving a B. S. degree in Mechanineal Engineering in 1932 and a Master's degree in 1937. After graduation he became associated with the Steel and Tubes Division of Timken Roller Bearing Company, With Revere Copper and Brass, he will operate directly with Charles W. Thomas, Vice President and General Manager of the Michigan Division, and W. W. Roach, Industrial Sales Engineer.

Hercules Powder Display at World's Fair

World's Fair

For displaying some of its products produced in the South, the Hercules Powder Company of Wilmington, Del., has an exhibit in the Georgia Building in the Court of States at the New York World's Fair. The background for the display is an enlarged photograph of the company's plant at Brunswick, Georgia; a photographic reproduction of a stump puller, and a photograph showing the unloading of pine wood from which Hercules Naval Stores Products are made. Ground wood in the form of fresh pine chips is also shown. Finished Hercules Naval Stores Products on display are; Vinsol's Resin, Betro's resin, F.E.L.M.N., and W.G. wood roshn. Terposol', Yarmor's Pine Oil 302, Risor's Pine Oil, Dipentene No. 122*, Turpentine, Tarol's, Solvenol's No. 1, Alpha Pinene, Turpeneol, and B-3 Reagent.

TRADE LITERATURE

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SCULLY STOCK LIST AND REFERENCE BOOK—

BOOK—
Book—This 250-page stock list and reference book for 1939 of the Scully Steel Products Company, subsidiary of United States Steel Corporation, has been published mainly for greater convenience in ordering material from stock; a new type of circular wire binding allows the book to be manipulated with one hand and yet remain flat; attractive cellophane process cover is also a feature.

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Scully Steel Products Company, 208 South LaSalle Street, Chicago, 111.

CONVEYORS HANDBOOK-

Catalog No. HB39—designed expressly for engineers and plant operating personnel, pocket size 4% inches by 4 Inches by 6½ inches, containing 381 pages of engineering materials; offered without obligation to engineers and key men in various plants. Mathews Conveyor Company, Eliwood City, Pa.

PUMPING EQUIPMENT-

Bulletin W-341-B4—devoted to Worthington Centrifugal Horizontally Split-Two-Stage Heavy Duty Process Pumps for Refinery Service, Type UT:
Bulletin W-341-B5—to Worthington Centrifugal Heavy Duty Process Pumps Horizontally Split-Single-Stage for Refinery Service, Type LT:
Bulletin W-321-B13—Worthington Monobloe Centrifugal Pumps, Turbine Drive, Types DY, DEY, DHY, DKY, DENY; Bulletin W-350-B25A—Worthington Vertical Turbine Pumps for Cofferdam Dewatering and Mine Sinker Service; Bulletin S-500-B35—Worthington Diesel Engines, Vertical Four-Cycle, Direct-Injection, Totally Enclosed, Type CC, Worthington Pump and Machinery Corporation, Harrison, N. J.

TOOL STORAGE EQUIPMENT-

COLL STORAGE EQUIPMENT—
Catalogue—illustrating and describing the construction of Steel Tool Storage Equipment, presenting a wide variety and describing the use of each for different types and classes of small tools; also are methods of bar storage, shop equipment, enclosure panels, and tool and die storage.

Lyon Metal Products, Incorporated, Aurora, III.

ELECTRIC HOIST-

Polder—illustrating and describing the new "Quik-Lift" electric hoist, offering the maximum in efficiency, speed, power and durability, available with either lond hook or trolley suspension, in capacities from 250 to 4000 pounds and weighing from 89 to 195 nonads

195 pounds. Coffing Hoist Company, Danville, III.

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Bulletin—devoted to INSULCRETE, a light weight cellular insulating refractory con-crete used for direct exposure to flame and furnace gases up to 2500 degrees Fahren-heit in oil and gas fired and electrically heated furnaces of many types. Quigley Company, Inc., 56 West 45th Street, New York, N. Y.

RUYING, SELLING AND BURNING COAL-

BOOK—"How to Buy, Sell and Burn Coal," by Thomas A, Marsh, Author of "Combustion in the Power Plant," presenting in nontechnical language and giving examples and reason: How to select coal for manufacturing plants, commercial he at in g plants and for residential use; how to cut fuel bills, stop smoke, increase efficiency, increase steam output, and how to "read fires"; price of single copy \$1.00.

Thomas A, Marsh, 5625 Kenwood Avenue, Chicago, Ill.

"Are Welding in Design, Manufacture and Construction"—Containing 1408 pages and a total of 635 numbered illustrations, including photographs and line drawings, a volume bearing the foregoing title has been published by The James F. Lincoin Are Welding Foundation of Cleveland, Ohio. It presents 109 original studies of welding by acknowledged leaders in various branches of industry, coveriey the outstanding papers of the recent 820 500 Award Program of the Foundation, At a meeting last fall, the trustees of the Foundation, feeling that the award papers constitute a large and valuable source of scientific study, research and information on welding, decided to make the material generally available. The book has been under preparation for six months, and, with few exceptions, the papers have been reproduced in compilee form, only those which are too lengthy for publication in their entirety being in the form of comprehensive briefs. The price of the volume is \$1.50 in the United States and \$2.00 elsewhere, postage prepaid.



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Chemurgy Comes South

(Continued from page 27)

it hurt. Hence those countries have been desperately trying to make themselves self-sufficient in this respect. Their shortage has therefore decreased. Ours has increased.

Our shortage of fats and oils has been made up with hugh imports from foreign countries. Imports came from 31 foreign countries in 1937 in the staggering amount of 2,828,325,000 pounds. Crop control and drouths during the last two or three years have had something to do with this huge shortage. But there was a shortage of around 1700 million pounds or more a year for 8 or 10 years before we had these drouths and crop control. Drouths and crop failures will doubtless come again in greater or less severity. Crop control-limitation of production-is now declared by some in high authority to be a national policy. So this shortage may continue or go on increasing. What are we going to do about it?

We must find an answer. This country with its immense surplus acreage which cannot profitably produce more corn or wheat, must not continue to depend upon huge imports of fats and oils. They can be grown here at home. This may mean a definite change in our farm crops. We must continue to produce as much cottonseed oil as we can with profit. We must expand the production of such vegetable oils as peanut oil. The peanut is an important southern crop. It can be grown cheaply over a wide area. It is necessary only to develop high yield varieties, and methods for handling the crop in the field and after the harvest season to make it possible for us to substitute its oil for the palm oil, cocoanut oil, and other imported vegetable oils. Attention may well be called to the fact that peanuts are not only rich in oil, but in protein, and it is to the vegetable proteins that we are now looking for raw materials for our chemical plants which are finding them useful in many industries.

Our cotton lands grow sweet potatoes in great abundance, and now a new use for the sweet potato is being developed. That use is in the manufacture of sweet potato starch. All the technical difficulties in converting sweet potatoes to starch have been solved. The only difficulty now remaining is that of finding a market which will pay the farmer a reasonable price for the starch he grows. The starch from his potatoes has to compete with imported starch. This year 500,000,000 pounds of tapioca flour. grown on the other side of the world by cheap labor on the rich tropic soils of Java, are being used by our textile mills, by our glue makers, by briquette manufacturers, by scores of other industries who in other years came to the corn belt for sizing and adhesive and other materials and uses. This hugh volume of cheap starch replaced 15,000,000 bushels of our corn, the crop of 500,000 acres of rich land.

It takes nearly 100 pounds of sugar to supply the energy food for everyone of our 130,000,000 people. Sugar is a comparatively new food. Until 100 years ago, it was a delicacy, a highly priced article which sweetened the food of the wealthy. Today, it is the cheapest and the purest and the most concentrated form of energy food. We can grow it in every state. It flows from the trees in New England as maple sap: the beet fields scattered from Michigan to California supply it; the sorghum patches on isolated farms all over the Midwest and South furnish sweetening for breakfast cakes; great factories in the corn belt convert cornstarch into corn sugar, and the juices of sugar cane produce an increasing volume of cane sugar. But in spite of all these sugar sources, about 75 per cent of the contents of American sugar bowls is foreign sugar, produced on cheap land by cheap labor and imported in enormous volume while we are frantically searching for the reason why the American farmer is unable to make a good living.

What would it mean to our farmers if they were raising the beets and cane and corn from which to extract the millions of tons of sugar which we import from foreign lands, while our beet fields in Michigan and Iowa and Colorado and Utah and California and our canelands in Louisiana and Florida lie idle?

It may well be that in the years to come our country will be on an entirely self supporting sugar basis, and that instead of going to Cuba for sugar we shall grow cane sugar in Louisiana and Florida.

All this discussion except perhaps of Cuban sugar has related to the development through research of new uses for old crops. There is another chemurgic interest which is equally valuable. That is the growing of new crops which have heretofore been imported from other lands but which can be grown in our own country and with our own labor. These new crops will displace no product now grown. They have as definite a place in our agricultural practice as the soybeans brought here from China, citrus fruits from Spain and Sicily, alfalfas, clovers and grasses, Durum wheat, Kaffir corn and sorghums discovered by our agricultural explorers in their round-theworld searches.

CONCRETE FOR SHORE PROTECTION—
Booklet—illustrated, presenting briefly some of the basic principles of shore protection and discussing different effects of wave action and offering suggestions for proper protection; appropriate examples of existing structures are given to illustrate modern design practice and show successful installation under different conditions, the cover illustrations showing the bay-shore wall at Tampa, Fla.

Portland Cement Association, Chicago, Ill.

Cattle Replace Cotton in South Carolina

(Continued from page 29)

loads of little pigs. Up there in the red hills it is hard to raise hogs as the clay soil packs in the lots and pastures. So on pay days they come to the store and take home little pigs in pokes, to be penned and enjoy apples and table scraps, at length becoming huge fat Spartanburg or Greenville hogs, providing choice hams and sausage and backbone for the expectant family that has tended and watched them 'neath the old apple trees.

The first year the Walterboro Live Stock Market operated, the total sales were \$145,000, the second year \$250,-000, while the third year promises to be well over \$300,000-more than the value of the current local cotton crop, in a once all-cotton land. Now almost no inferior stock is brought in, the county is getting away from the scrub and the razorback by leaps and bounds. The cattle seen are chiefly Herefords with some Black Angus and Short Horn; the hogs are Hampshires with Poland China and Duroc as close seconds. This spring a fat stock sale was promoted for the farm boys by the local Lion's Club with gratifying results, and this, from now on, will be an annual event. So not only has coastal South Carolina in the course of a few years lifted itself up with better cattle, but by encouraging the boys the good work is projected on to the next generation. Permanent pastures are a token of permanent prosperity.

"I don't worry 'bout the boll weevils no more, they ain't never bit none o'my cows." Thus was the new farm hope tersely expressed by a former Colleton County cotton farmer as he shoved a fat wad of bills down in his jeans, the fruit of a truck load of home grown Herefords.

Southern University Confers Degree on Hook

On Hook

Charles R. Hook, president of The American Rolling Mill Company, Youngstown, Ohio, has been awarded the degree of Doctor of Commercial Science by Oglethorpe University, Atlanta, Ga., the degree having been presented by Judge Edgar Watkins, president of the Board of Directors, in connection with the 20th annual graduation exercises, which marked the Silver Jubilee of the University. Other prominent men receiving degrees were John Marshall Slaton, former governor of Georgia; Stirling Price Gilbert, former Justice of the Supreme Court of Georgia, nutries of the Supreme Court of Heaving Marshall Slaton, former Justice of the Supreme Court of Georgia, nutries of the Supreme Court of Heaving Marshall Slaton, former Justice of the Supreme Court of Georgia, nutries of the Supreme Court of Georgia.

Barber Asphalt Opens Offices

The Barber Asphalt Corporation which has completed the construction of additional office facilities at its plant at Barber, at a cost of approximately \$250,000, formally opened its new offices on May 15, moving its general offices from Philadelphia to Barber, in the northern limits of Perth Amboy, N. J. The new building doubles the present office space, and, with the addition, is 259 feet long, 3 stories with a 50-foot depth, giving it a total of 42,000 square feet. The first floor is occupied by plant executives and sales or ganizations; the second floor by the accounting and auditing departments and treasurer's staff, and the third floor by executive officers. James E. Auten is president of the corporation.



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Timber Resources of the South

(Continued from page 31)

on restocking areas, and 47,535,000 cords (19,175,000 cords of softwood and 28,360,-900 cords of bardwood) on the saw timber areas.

Virginia

Approximately 13,610,000 acres or about 50 per cent of Virginia's 26,768,000 land area is described as forest land, and of this, 13,375,000 acres comprises commercial forest with 6,200,000 acres supporting 22.150.000,000 board feet of saw timber. Softwoods totaling 10,960,000,-600 board feet include 2,570,000,000 board feet old growth and 8,390,000,000 board feet second growth while 4,090,000,000 board feet old growth and 7,100,000,000 board feet second growth make up to 11,190,000,000 board feet of hardwoods. Old growth and second growth of all sawtimber covers 1.325,000 and 4.875,000 acres respectively. Softwoods include: Southern pine, 9,850,000,000 board feet; iemlock, 450,000,000 board feet; cypress, 300,000,000 board feet; white pine, 180,-100,000 board feet; and miscellaneous, 180,000,000 board feet. Hardwoods include: oaks 4,220,000,000 board feet; yellow poplar, 1,400,000,000 board feet; red gum, 1,390,000,000 board feet, tupelo and black gum, 1,200,000,000 board feet; and mixed, 2.980,000,000 board feet,

The greatest volume of cordwood is on the saw timber areas and consists of 45,-240,000 cords (16,110,000 cords of softwood and 29,130,000 cords of hardwood). On the cordwood area of 4,095,000 acres are 6,025,000 cords of softwood and 10,-540,000 cords of hardwood or a total of 16,565,600 cords. Together, these two groups with the small quantity on restocking areas make a grand total of over 62,550,000 cords.

West Virginia

Compared with a total land area of 15,374,000 acres, West Virginia's 8,960,-

000 acres of forest land represents considerably more than half the state and of this amount, 8,860,000 acres, or almost all the forest land is designated as commercial forest.

Reversing the condition prevailing in most of the other Southern states, the major part of West Virginia's forest land is the cordwood area amounting to 3,985,000 acres containing 1,020,000 cords of softwood and 13,109,000 cords of hardwood or a total 14,200,000 cords. From the point of view of quantity however, the largest cordwood volume is on saw timber areas and comprises 1,600,000 cords of softwood and 19,900,000 cords of hardwood—21,500,000 cords, or a grand total of 35,625,000 cords exclusive of a small quantity on restocking areas.

The saw timber areas of 2,660,000 acres, including 665,000 acres old growth and 1,995,000 acres second growth, support a stand of 8,850,000,000 board feet. Softwoods, with 600,000,000 board feet old growth and 500,000,000 board feet second growth, total 1,100,000,000 board feet while hardwoods totaling 7.750,000,-000 board feet include 2,580,000,000 board feet old growth and 5,170,000,000 board teet second growth. Softwoods are well distributed, with hemlock-490,000,000 board feet, Southern pine-270,000,000 board feet, spruce and fir-230,000,000 board feet, and white pine-110,000,000 board feet. The largest portion of hardwoods, 3,300,000,000 board feet, is in mixed species: oaks measure 2,550,000,-000 board feet; beech, birch and maple, 1,550,000,000 board feet; and yellow poplar, 350,000,000 board feet.

Railroads Spend \$52,000,000 A Year in Tennessee

(Continued from page 25)

\$2,006,475 went to defray the general costs of government and to maintain the public highways, and \$1,176,758 went into public school funds. The average cost of education per pupil in Tennessee is \$42,84, according to the latest government figures. Therefore, the school taxes paid

by the railroads in the counties and towns of Tennessee in 1937 were sufficient to defray the cost of providing a year's public education for approximately 27,500 school children in the state.

The Class I railroads and the Pullman Company reported more than 23,000 employes in active service in Tennessee in 1937 — locomotive engineers, firemen, conductors, trainmen, shopmen, station employes, track workers, telephone linemen, signalmen, office workers and numerous other railroaders—widely distributed over the state. The majority of these men'are heads of families; many thousands of them are home owners and taxpayers, substantial citizens of the communities in which they live.

Although Tennessee ranks thirty-first in railway mileage, it ranks nineteenth in the size of its railway payroll, which pours many millions of dollars into the state annually and contributes to the well-being of hundreds of cities and communities throughout the state. In 1937, Class I railroads and the Pullman Company reported aggregate payroll expenditures in Tennessee of \$35,633,000, an amount equal to the combined payrolls of 539 average Tennessee manufacturing plants.

In many Tennessee communities where railroads provide the principal employment, the railway payroll is the business barometer. The railroad payroll fluctuates with the rise and fall of railway earnings. Every improvement in railway earnings is quickly translated into increased sales and greater prosperity among the merchants and business firms of Tennessee.

The foregoing facts concerning railway purchases, tax payments, employment and payrolls point to the great stake which Tennessee has in her railroads, wholly aside from the vital service which these agencies perform in the transportation of passengers, freight, express and mails.

WASHROOM PLANNING— Booklet—presenting typical layouts drawn by Bradley engineers for washroom service. Bradley Washfountain Company, Milwaukee, Wis.

Summary of South's Timber Resources

State	Total land area of state (acres)	Total com- mercial forest land (acres)	Total sawtim- ber area (acres)	Total sawtimber stand (board feet)	Total cordicood area (acres)	Total cordwood volume (cords)
Alabama	32,819,000	18,837,000	10.174,000	38,490,000,000	3,825,000	75,795,000
Arkansas	33,616,000	20,670,000	10,490,000	36,797,000,000	4,715,000	91.050.000
Florida	35,111,000	21,850,000	3,320,000	23,440,000,000	2.710,000	46,740,000
Georgia	37,584,000	21,035,000	11,365,000	45,800,000,000	3,755,000	89,210,000
Kentucky	25,716,000	9,400,000	2,820,000	9,750,000,000	4,230,000	22,900,000
Louisiana	29,062,000	16,185,000	10,055,000	42,425,000,000	2,045,000	84,000,000
Mississippi	29,672,000	15,860,000	8,325,000	35,935,000,000	3,115,000	72,405,000
North Carolina	31,194,000	18,160,000	9,045,000	43,080,000,000	4,780,000	85,990,000
Oklahoma	5,845,000	4,225,000	1,925,000	4,090,000,000	1,040,000	10,865,000
South Carolina	19,517,000	10,705,000	6,220,000	30,315,000,000	1.905,000	53,260,000
Tennessee	$26,679,00\overline{0}$	12.555,000	3,140,000	16,950,000,000	6.275,000	54.587.000
Texas	36,825,000	10,805,000	7,160,000	28,500,000,000	1,480,000	55,000,000
Virginia	26,768,000	13,375,000	6,200,000	22,150,000,000	4,095,000	62,550,000
West Virginia	15,374,000	8,860,000	2,660,000	8,850,000,000	3,985,000	35,625,000
Total	385,782,000	202,522,000	92,899,000	386,572,000,000	47,955,000	839,977,600

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Growing of bulbs and flowers is one of North Carolina's newest ind stries. Started in the fall of 1925 by Hendrik Van Dorp, 150 acres of land in and around Terra Ceia are now given over to the raising of daffodils, tulips, and some other flowers. Within this space of time, Mr. Van Dorp, who cultivates about half the entire acreage, has built up a business of shipping between 150,000 and 200,000 dozen flowers annually while last year approximately one million bulbs also were sold. Success of the project is due to the location, being far enough south to obtain early flowers and yet far enough north to obtain winter frosts. The community consists of about sixty people made up of 14 families who came direct from Holland or are of Dutch descent.

Institution of Mechanical En- A New Plastic Compound gineers of Great Britain to Meet with A. S. M. E.

For the first time in thirty-five years, except for a short visit in 1932, the Institution of Mechanical Engineers of Great Britain is coming to the United States this fall, Sept. 4 to 8, to meet with the American Society of Mechanical Engineers.

At the meeting the two societies will be joined by the Institution of Civil Engineers and the Engineering Institute of Canada who are meeting with the American Society of Civil Engineers.

The technical program is to be devoted to the Mechanical Problems of Modern Transportation. A session is to be devoted each to marine, railroad, highway, and transatlantic-airplane transport. At each session, there is to be one paper by a British and one by an American author as follows:

Marine Transport:

Sterry B. Freeman, superintending engineer, Alfred Holt and Co., Liverpool, England.

Robert C. Lee, vice-president, Moore & McCormack Co., Inc., New York, N. Y. Light-Weight High-Speed Trains:

William A. Stanier, chief mechanical engineer, L. M. & S. Railway, London, England.

Charles T. Ripley, chief engineer, Technical Board, Wrought Steel Wheel Industry, Chicago, Ill.

Highway Transportation:

E. C. Ottaway, technical officer, London Passenger Transport Board, London, England.

F. C. Horner, assistant to the chairman, General Motors Corp., New York, N. Y.

Transatlantic Airplane:

A. Gouge of Short Bros., Rochester, England.

Edmund T. Allen, director of aerodynamics and flight research, Boeing Aircraft Co., Seattle, Wash.

from Sugarcane Bagasse

A plastic compound made from the lignin and cellulose of sugarcane bagasse, one of the country's important agricultural waste products, has been manufactured by chemists of the United States Department of Agriculture at the Agricultural By-Products Laboratory, Ames, Iowa. The chemists estimate that this new compound can be manufactured for less than half the cost of the cheapest synthetic plastic compound now on the

In recent years, they point out, production of synthetic plastic compounds has expanded rapidly. But the comparatively high cost of molding powders, mostly alkyd and phenol-formaldehyde resins, confines plastic manufacture largely to small articles. It seems unlikely that the price of these raw materials can be reduced materially. With a low-cost molding compound made with only a small amount of expensive chemicals, the plastics industry could branch out into broader fields, such as the manufacture of furniture, building materials, and parts for automobiles. Too, where certain qualities of the costlier phenolformaldehyde resins are not required, the cheaper product could be substituted.

The Department chemists found that molding compounds may be made from the bagasse by three methods.

The first, and cheapest, is hydrolysis with acid. Counting the cost of bagasse at \$8 a ton, baled and delivered at the factory, the chemists estimate that a plastic compound can be made by this method. in which the cost of material will be slightly more than two cents a pound. Plastics made from the compound, while not so strong as some synthetic products now in use, are quite moisture resistant and would be suitable for molding bathroom tile for both floors and walls. They apparently have the wearing ability of wood and may be sanded and repolished

through the entire body.

The second method is hydrolysis in the presence of aniline, a coal tar derivative. The material cost of plastics from this process will be more-about 41/2 cents a pound-but they are as strong as plastics now in use. In tests it has resisted bending pressures up to 9,000 pounds per square inch. They are slightly less waterresistant than plastics made by the first method, but do not warp and may be sawed, drilled and, with care, nailed. These properties suggest uses as card table tops, desk tops, and building panels.

Treating the bagasse with sodium hydroxide and furfural is the third process. In quality plastics from this method are about midway between the other two. They flow better and mold at 2,500 pounds per square inch compared with 3,500 for the second treatment. They may be put to the same uses as the plastic from the second treatment.

Either of the plastics made from the last two processes do not shatter easily. In fact, neither breaks when struck hard enough with a hammer to cause a dent.

It is possible that other farm waste materials, such as cornstalks and straw from small grains, may be used in making plastics by the same processes, the chemists report.

Exports of Kraft Container Board

The exportation of kraft container board, a product of the southern paper mills, is becoming increasingly important, according to the Forest Products Division of the U.S. Department of Commerce. Exports of this product were valued at \$157,217 in March bringing the total for the first three months of this year to \$439,000.

The valuation of the exports was the largest for any single item of paper and pulp sold abroad during the three months of 1939.